

EXHIBIT 22

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**UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA**

ANIBAL RODRIGUEZ, SAL CATALDO,
JULIAN SANTIAGO, and SUSAN LYNN
HARVEY, individually and on behalf of all other
similarly situated,

Plaintiffs,

v.

GOOGLE LLC,

Defendant.

Case No. 3:20-cv-04688-RS

EXPERT REBUTTAL REPORT OF ANINDYA GHOSE, PH.D.

May 31, 2023

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I. INTRODUCTION

A. Qualifications

1. I am the Heinz Riehl Chair Professor of Business at New York University’s Leonard Stern School of Business, where I hold joint appointments as Professor of Technology, Operations, and Statistics and Professor of Marketing. I also serve as the Academic Director of the Masters of Business Analytics program at NYU Stern. At NYU, I have served in a number of capacities, including Director of the Center for Business Analytics, Co-Director of the Center for Digital Economy Research, Co-Director of the Masters of Science in Business Analytics Capstone, and Co-Chair of the NYU-AIG Partnership on Innovation for Global Resilience. I have both an MS and Ph.D. degree from Carnegie Mellon University.
2. The principal focus of my research and teaching at NYU has been analyzing the economic consequences of the internet and mobile technologies on industries, firms, and markets transformed by their shared technology infrastructure. I have worked on economic issues arising in digital platforms, online markets, internet commerce, digital marketing, digital advertising, mobile advertising, and social media, among other topics. I have published 110 papers in premier scientific journals and peer-reviewed conferences, including work that has analyzed user behavior with respect to data privacy issues in the digital and mobile economies. I have also co-authored more than 100 workshop articles. I have received 27 Best Paper awards and nominations for excellence in research in Information Systems, Computer Science, and Marketing from various journals, conferences, and workshops.
3. My book “TAP: Unlocking the Mobile Economy” is a double-winner in the 2018 Axiom Business Book awards, with the Gold award in the Business Technology category and the Bronze award in the Economics category. It illustrates how firms can leverage the highly granular, consumer-level data that is being generated from smartphones and digital technologies to create targeted offers and discusses the behaviors demonstrated by consumers with respect to data privacy issues. The book has been translated into five languages so far. My research and opinions have been profiled numerous times in the U.S. and international media. I have another book forthcoming in 2024 on the topic of Artificial

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Intelligence to be published by MIT Press and is titled “Thrive: Maximizing Emotional, Physical, and Material Well-Being in the Age of AI.”

4. I am currently the Department Editor of Management Science for Information Systems. In the past I have served as a Senior Editor of Information Systems Research and Associate Editor of Management Science. I am a winner of the National Science Foundation’s (“NSF”) CAREER award, their most prestigious award in support of junior faculty who “have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization.” I have received grants from the NSF, Google, Microsoft, Adobe, Marketing Science Institute, Wharton Customer Analytics Institute, and the Networks, Electronic Commerce, and Telecommunications Institute in recognition of my research.
5. I have received numerous awards, honors and recognitions. I am a recipient of the INFORMS Information Systems Society (“ISS”) Distinguished Fellow Award, which recognizes individuals who (i) have made outstanding intellectual contributions to the discipline with publications that have made a significant impact on theory, research, and practice; and (ii) contributed to the intellectual stewardship of the field as reflected in the mentoring of doctoral students and young researchers. In 2014, I was named by Poets & Quants as one of the Top 40 Professors Under 40 Worldwide. In 2017, Thinkers50, the premier ranking of global business thinkers, recognized me as one of the top management thinkers most likely to shape the future of how organizations are managed and led. In 2019, I was recognized by the Web of Science citation index in the top one percent of researchers selected for their significant influence in their fields. In 2020, I was recognized by the INFORMS ISS with the inaugural Practical Impacts Award. This award honors business school academics who have demonstrated outstanding leadership and sustained impact on the industry by deeply influencing practitioners, managers, executives, and policy makers using their academic research. In 2022, I received the AIS Fellow Award from the Association of Information Systems, which recognizes individuals who have made significant global contributions to the information systems discipline as well as outstanding local contributions in the context

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of their country and region. In 2022, I also received the Distinguished Alumni award from Indian Institute of Management, Calcutta.

6. I have consulted in various capacities for many leading firms on realizing business value from information technology (“IT”) investments, internet marketing, business analytics, data science, mobile marketing, digital platforms, social media, AdTech, and other areas. I serve or have served as an advisor to several start-ups in the internet and mobile space across the U.S., India, China, South Korea, Singapore, the U.A.E, the Netherlands, and the U.K., and am on the advisory board of several of these companies. I have also conducted academic research in collaboration with many leading companies and have co-authored research papers using these companies’ data. I am also an advisor to venture capital funds in the U.S.
7. I have taught courses on the role of IT in business and society, internet commerce, social media, AdTech, digital marketing, and business analytics at the undergraduate, MBA, Executive MBA, Masters of Science in Business Analytics, Executive Education, and Ph.D. levels worldwide. Many of these courses involve taking a deep dive into the economics of privacy and various other aspects of the AdTech ecosystem. In 2019, I won the NYU Stern school-wide “Distinguished Teaching” award.
8. I have also served as an expert witness for IT and consumer-related litigation and have provided expert testimony in multiple trials and depositions. A copy of my curriculum vitae and a list of my testimony are attached as Appendix A.
9. I am being compensated for my work in this matter at my current hourly rate which is \$1,200. Professional staff members at Compass Lexecon also performed support work for me under my direction. In addition, I receive compensation based on a proportion of Compass Lexecon billings. Neither my fees nor those of Compass Lexecon are contingent upon the conclusions I reach or on the outcome of this matter. A list of all materials considered in this report is attached as Appendix B.

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B. Assignment

10. Michael J. Lasinski submitted a report on behalf of counsel for Plaintiffs, dated February 20, 2023. Mr. Lasinski was retained to “provide expert analysis and, if requested, expert testimony regarding the measures of monetary relief that may be appropriate if liability is found against Google LLC (“Google”) for the alleged wrongful conduct described in Plaintiffs’ Fourth Amended Complaint.”¹ Further, Mr. Lasinski’s assignment includes “assessing the feasibility of identifying and quantifying various measures of monetary relief tied to Plaintiffs’ claims, including [] Google’s unjust enrichment and Plaintiffs’ actual damages during the period July 1, 2016 through December 31, 2022.”²
11. I have been asked by counsel for Google to review and, if appropriate, respond to Mr. Lasinski’s “actual damages” opinion from the basis of my background and my review of available evidence and academic and practitioner literature. I have focused my opinions in most cases to conceptual issues and have not attempted to evaluate every specific claim made by Mr. Lasinski. That one or more of his claims is not explicitly addressed here should not be construed to imply that I agree with those claims.
12. My work on this matter is ongoing, and I reserve the right to update my opinions as additional information becomes available.

C. Background

1. Relevant case facts

13. In its Complaint, Plaintiffs allege that Google has collected and used, without notice or consent, consumers’ “highly personal browsing histories on their mobile devices, whenever consumers use certain software applications [] that have incorporated Google code,” even

¹ Expert Report of Michael J. Lasinski, February 20, 2023 (“Lasinski Report”), at ¶ 9.

² Lasinski Report, at ¶ 10.

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when “Plaintiffs had turned off a Google feature called ‘Web & App Activity’ (‘WAA’) or a sub-setting within WAA known as ‘supplemental Web & App Activity’ (‘sWAA’).”³

14. Mr. Lasinski describes the allegedly improperly collected data (which he refers to as “WAA/sWAA-Off Data”) as data “that Google collects relating to user activity on non-Google mobile applications by way of the Firebase SDK and/or the GMA SDK while a user is signed into Google and has WAA or sWAA turned off.”⁴ I will also refer to this data as “WAA/sWAA-Off Data” in my Report.

15. Mr. Lasinski characterizes “actual damages” as a “function of the payments necessary to incentivize an individual to knowingly surrender the choice to keep activity on mobile apps private and allow an organization to track app activity data.”⁵

2. Summary of Mr. Lasinski’s “Actual Damages” opinion and bases

16. Mr. Lasinski provided a measure of “actual damages attributable to Google’s alleged wrongful conduct” in Section 8 of his report.⁶ Mr. Lasinski opines that the “most probative indicator of the harm to WAA/sWAA-Off users” is “the baseline payment to Screenwise Panel participants of \$3 per month for using a Screenwise meter app on a single mobile device” and that this is a “conservative indicator of the monthly payment necessary for an individual to knowingly surrender the choice to keep their app activity private and allow Google to track all app activity data.”⁷ Mr. Lasinski further opines that “actual damages [] can be conservatively measured by applying this \$3 payment on a *one-time basis* to the number of Class Member Devices [] used with WAA/sWAA off at least once during the Class Period through December 2022.”⁸

³ Fourth Amended Complaint, *Anibal Rodriguez, Sal Cataldo, Julian Santiago, and Susan Lynn Harvey, individually and on behalf of all other similarly situated v. Google LLC*, United States District Court, Northern District of California, January 4, 2023 (“Complaint”), at ¶ 1.

⁴ Lasinski Report, at ¶ 74.

⁵ Lasinski Report, at ¶ 130.

⁶ Lasinski Report, at pp. 47-59.

⁷ Lasinski Report, at ¶ 131.

⁸ Lasinski Report, at ¶ 131, emphasis added.

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D. Summary of principal conclusions

17. My principal conclusions are as follows:

- a. Mr. Lasinski’s “actual damages” analyses are flawed and unreliable because they fail to account for user heterogeneity in concerns about privacy as well as the difficulty in accurately determining users’ valuations for personal data and privacy.
- b. Mr. Lasinski has provided no direct or empirical evidence demonstrating that the data collected by the Ipsos Screenwise Meter or his other proposed “indicators” are comparable to Google’s collection of WAA/sWAA-Off Data.
- c. In addition, Mr. Lasinski ignores user benefits received from providing app analytics data to Google and third-party app developers, which should have been accounted for in his “actual damages,” but are not.
- d. The information that Mr. Lasinski relies upon in an attempt to establish “actual damages” is therefore unreliable.

II. MR. LASINSKI’S “ACTUAL DAMAGES” BASED ON THE IPSOS SCREENWISE PANEL, OR ANY OF HIS OTHER PROPOSED ALTERNATIVE MEASURES, DO NOT ACCOUNT FOR USER HETEROGENEITY IN CONCERNS ABOUT PRIVACY AS WELL AS THEIR VALUATIONS FOR PERSONAL DATA, AND ARE THEREFORE FUNDAMENTALLY FLAWED AND UNRELIABLE

A. Users are heterogeneous with respect to their concerns about privacy

18. Mr. Lasinski’s “actual damages” method ascribes the same dollar value of WAA/sWAA-Off Data to all users in the purported class. That is, his measure of \$3 from Ipsos Screenwise applies uniformly to all purported class members, regardless of each individual class member’s valuation for data and concerns about privacy (or lack of concerns about privacy), which Mr. Lasinski has not assessed or measured. In fact, based on the academic literature, a single “one-size-fits-all” dollar figure that does not account for heterogenous user preferences or heterogeneous valuations for data privacy is fundamentally flawed, unscientific, and hence unreliable. Individual inquiry is therefore required to determine purported class members’ preferences and valuations of their privacy.

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19. Mr. Lasinski states that the “baseline payment to Screenwise Panel participants of \$3” is a “conservative indicator of the [] payment necessary for an individual to knowingly surrender the choice to keep their app activity private and allow Google to track all app activity data.”⁹ In this statement, Mr. Lasinski makes the unsubstantiated assumption that anyone who turned WAA/sWAA off at any point during the class period did so because they wanted to keep their app activity data private and did not want to share app activity data with Google.
20. The first part of Mr. Lasinski’s assumption (i.e., that anyone who turned WAA/sWAA off at any point during the class period did so because they wanted to keep their app activity private) is inconsistent with the fact that anyone who uses a third-party app has to consent to the app’s privacy policy (which is separate and distinct from Google’s own privacy policy and Terms of Service).¹⁰ In theory this indicates that some users may have understood that the third-party app developer’s use of their app activity data will be governed by the privacy policy of that third-party app developer.¹¹ Therefore, Mr. Lasinski’s assumption that all

⁹ Lasinski Report, at ¶ 131.

¹⁰ At his deposition, Mr. Ganem, reading from Google’s Privacy Policy (Effective March 31, 2020), stated that Google’s “privacy policy [Ganem Deposition Exhibit 212] does not apply to services offered by other companies or individuals, including products or sites that may include Google services. So this, I believe, is indicating that the [Google Privacy] policy in this document does not apply to data collected by third parties in their own apps where they’re the owners of the data.” Deposition of Steve Ganem, October 28, 2022., at 178:23-179:6. This is also supported by the academic literature. See, e.g., Robert E. Crossler and France Bélanger (2019) “Why Would I Use Location-Protective Settings on My Smartphone? Motivating Protective Behaviors and the Existence of the Privacy Knowledge–Belief Gap,” *Information Systems Research*, 30(3):995-1006, <https://doi.org/10.1287/isre.2019.0846> (“Crossler and Bélanger (2019)”), at pp. 996-997 explaining that “[f]or example, with a smartphone, each interaction for activities, such as banking and driving, requires its own dedicated app with its own settings to control information sharing. These settings then predetermine the level of information disclosure allowed each time the app or smartphone is used regardless of where and when” and that “[p]rivacy settings may allow for application-level controls that prevent unintentional information sharing, but only if the user enables them. Thus, mobile information protection relies on users properly utilizing information-protective settings for each app on their device.”

¹¹ In addition, I understand that “[a]pp developers who use the GA for Firebase SDK must agree to Google Analytics Terms of Service, which requires that app developers disclose the use of Google Analytics and how it collects and processes data. [] App developers who use GA for Firebase SDK have been expected to comply with the Google Analytics Terms of Service and/or the GA for Firebase Terms of Service, including disclosing to end users that they use Google’s analytics services, and that certain data is being collected by the app developer and transmitted to Google to store, process, and analyze.” Defendant Google LLC’s Second Supplemental Objections and Responses to Plaintiffs’ Interrogatories, Set Six, *Anibal Rodriguez and Julie Anna Muniz v. Google LLC, et al.*, United States District Court, Northern District of California, San Francisco, July 14, 2020 (“Defendant Google LLC’s Second Supplemental Objections and Responses to Plaintiffs’ Interrogatories, Set Six”), at pp. 10-11. Furthermore, a study from Pew Research Center also found that only

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users who turned WAA/sWAA off during the class period did so to keep their app activity private is unsubstantiated and cannot be relied upon.¹²

21. The second part of Mr. Lasinski’s assumption (i.e., that anyone who turned WAA/sWAA off at any point during the class period did so because they did not want to share any app activity data with Google) is inconsistent with the literature and with my expertise regarding heterogeneity in users concerns about privacy. Users have different preferences and motivations when it comes to privacy, and their decisions to turn settings off might be influenced by a range of factors. Some users may disable these settings as a precautionary measure, even if they don’t necessarily care if their data is collected.¹³ And, as I discuss above, to use an app, virtually all users must agree to the app’s terms of service and privacy policy. According to Google’s own user studies, users may also inadvertently opt out of WAA and other settings when setting up their account in order to speed up the process.¹⁴ Relatedly, some users may opt out due to habit or what academics refer to as warning

22% of those that read privacy policies read “them all the way through” and “[a] majority of adults who read privacy policies say they typically understand them.” See Brooke Auxier, Lee Rainie, Monica Anderson, Andrew Perrin, Madhu Kumar, and Erica Turner (2019) “4. Americans’ attitudes and experiences with privacy policies and laws,” *Pew Research Center*, <https://www.pewresearch.org/internet/2019/11/15/americans-attitudes-and-experiences-with-privacy-policies-and-laws/> (“Pew Research (2019)”). See also, Crossler and Bélanger (2019), at p. 996.

- ¹² In addition, I understand that app developers’ privacy policies disclose that user data generated on the app are also transmitted to Google. See, e.g., NPR (2022) “Privacy Policy,” <https://www.npr.org/about-npr/179878450/privacy-policy> (“Our Services also make use of [] Google Universal Analytics, Google Analytics Demographics and Interest Reporting, Remarketing with Google Analytics, and Google Ad Manager. These Analytics & Sponsorship Services may use cookies, pixel tags, and other tracking and storage technologies to collect or receive information (not including your name or the email address you register with NPR) from our Services and elsewhere on the Internet and use that information to analyze and measure our audience and target and evaluate the effectiveness of sponsorship credits and marketing messages in our Services.”)
- ¹³ For example, “Plaintiff Harvey admitted during her deposition that she did not turn WAA on or off for any particular reason, and that she has not changed her behavior since filing this case despite the alleged violations of privacy.” See, e.g., Defendant Google LLC’s Second Supplemental Objections and Responses to Plaintiffs’ Interrogatories, Set Six, at p. 12; See also, Deposition of Susan Harvey, October 27, 2022 (“Harvey Deposition”), at 248:13-253:17.
- ¹⁴ For example, one participant to Google’s user studies commented “If you have a new phone you just want to use it and click through it. You don’t think how the data will be used.” When asked to recall consent choices that were just made, 15% of people who opted-out of consents including WAA did not remember or incorrectly remembered their choices. See GOOG-RDGZ-00209974, at pp. 209993, 210052. This is consistent with findings from a Pew Research Center study, which found that “[m]ore than a third of adults (36%) say they never read a privacy policy before agreeing to it,” and that only 22% of those that read privacy policies read “them all the way through.” See Pew Research (2019).

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fatigue.¹⁵ There may also be users who turn off WAA/sWAA but continue to share data with Google through other services by keeping other settings turned on.¹⁶ Users’ privacy preferences could therefore be context-dependent.

22. Although Mr. Lasinski’s damages method applies a uniform dollar value of data privacy to all class members, he has not demonstrated that class members’ privacy preferences and valuations of data privacy are homogenous. In particular, the literature suggests that there exists not only heterogeneity in privacy preferences and valuations for data privacy across users within the three categories of users (privacy pragmatists, privacy fundamentalists, and privacy unconcerned) but that there also exists “within user” heterogeneity amongst users based on context, time, or cost-benefit tradeoffs. Privacy research nomenclature traditionally identifies consumers as (i) “privacy fundamentalists,” who “reject[] consumer-benefit or societal-protection claims for data uses and sought legal-regulatory privacy measures;” (ii) “privacy unconcerned,” who are “generally ready to supply their personal information to business and government and reject[] too much privacy fuss;” or (iii) “privacy pragmatists,” who “examine[] the benefits to them or society of the data collection and use, want[] to know the privacy risks and how organizations propose[] to control those, and then decide[] whether to trust the organization or seek legal oversight.”¹⁷

¹⁵ See, e.g., Jialiu Lin, Bin Liu, Norman Sadeh, and Jason I. Hong (2014) “Modeling Users’ Mobile App Privacy Preferences: Restoring Usability in a Sea of Permission Settings,” *Symposium on Usable Privacy and Security (SOUPS) 2014, July 9-11*, <https://www.usenix.org/system/files/conference/soups2014/soups14-paper-lin.pdf>, at p. 205 describing that “participants felt quite comfortable letting mobile apps access sensitive personal data for internal functionality purposes. When their information is requested by 3rd-party libraries such as for delivering targeted ads or conducting mobile analytics, their attitude was close to neutral (i.e. neither comfortable nor uncomfortable). [] This group of participants also felt consistently comfortable disclosing all types of sensitive personal data to SNS libraries. Further research on why so many participants behave in this way is challenging and necessary. We suspect that this might be related to some level of habituation or warning fatigue, namely they might have gotten used to the idea that this type of information is being accessed by mobile apps and they have not experienced any obvious problem resulting from this practice.”

¹⁶ See, e.g., GOOG-RDGZ-00090149 for an analysis of “inconsistent settings.” In addition, according to the same document that Mr. Lasinski used to determine the percentage of accounts that ever had sWAA off during the time period between July 27, 2016 and July 27, 2020 (42.53%), a total of 97.61% of U.S. active accounts had Gaia Ads Personalization turned on during this same time period. See GOOG-RDGZ-00187010, at tab “GAP.” This inconsistency suggests that sWAA off is not necessarily a privacy choice, or, alternatively, users don’t spend the time to ensure settings are consistent.

¹⁷ Alan F. Westin (2003) “Social and Political Dimensions of Privacy,” *Journal of Social Issues*, 59(2):431-453, <https://doi.org/10.1111/1540-4560.00072>, at p. 445.

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23. The strictest of these three categories, privacy fundamentalists, is typically understood to constitute a minority of consumers, with the vast majority willing to share at least some personal information and data for a more meaningful engagement with the product or for some other value. The first studies of privacy fundamentalism in the 1990s found that this segment constituted approximately 25% of consumers in most surveys.¹⁸ In this matter, there is reason to believe privacy fundamentalists constitute a smaller share of the class than in the population at large because privacy fundamentalists, who are concerned with sharing their data, would be less likely to have consented to the third-party app disclosures about data sharing in the first place.¹⁹ Recent studies focusing on online behavior indicate a similar or lower proportion of privacy fundamentalists, and also indicate general heterogeneity of consumer views towards digital privacy. For instance:

- a. A 2021 survey of 2,038 U.S. respondents estimated that privacy fundamentalists represent “21% of the US population (down from 24% in [2017]),” pragmatists are 48% (down from 58%), and unconcerned are 31% (up from 18%).²⁰ That is, on the net, both pragmatists and fundamentalists are moving into the unconcerned category.

¹⁸ For example, 1990, 1996, 2000, and 2003 studies found privacy fundamentalists constituting either 25% or 26% of consumers, and a 2001 study found privacy fundamentalists to constitute 34% of consumers; 1990, 1996, 2000, 2001, and 2003 studies found privacy pragmatists constituting 55% to 64% of consumers and privacy unconcerned constituting 8% to 18% of consumers. See Ponnurangam Kumaraguru and Lorrie Faith Cranor (2005) “Privacy Indexes: A Survey of Westin’s Studies,” *Institute for Software Research International, Carnegie Mellon University*, <http://reports-archive.adm.cs.cmu.edu/anon/anon/home/ftp/usr0/ftp/isri2005/CMU-ISRI-05-138.pdf>, at pp. 17-18.

¹⁹ See, e.g., Bin Liu, Deguang Kong, Lei Cen, Neil Zhenqiang Gong, Hongxia Jin, and Hui Xiong (2015) “Personalized Mobile App Recommendation: Reconciling App Functionality and User Privacy Preference,” *Association for Computing Machinery*, <http://dx.doi.org/10.1145/2684822.2685322>, at p. 316 noting that “a user with high privacy concerns might sacrifice the App’s functionality for privacy or might transfer to another App that provides the same functionality but uses less private resources.”

²⁰ Global Data and Marketing Alliance (2022) “US Data Privacy: What the Consumer Really Thinks,” <https://globaldma.com/wp-content/uploads/2022/03/GDMA-US-Data-Privacy-2022.pdf> (“Global Data and Marketing Alliance (2022)”), at p. 6. While the results were published in 2022, the methodology section explains that the survey was conducted in December 2021. Global Data and Marketing Alliance (2022), at p. 29. Similarly, the earlier study was published in 2018, but the data were collected in 2017; Data & Marketing Association and Acxiom (2018) “Data privacy: What the consumer really thinks,” <https://marketing.acxiom.com/rs/982-LRE-196/images/DMA-REP-DataPrivacy-US.pdf> (“Data & Marketing Association and Acxiom (2018)”), at pp. 6, 18.

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- b. The 2017 version of the survey also found that “76% of respondents agree that they should be able to trade their data for better offers and services.”²¹
- c. In a paper published in 2019, my co-authors and I offered visitors to a major shopping mall the option of getting personalized mobile offers if they were to accept the offer to sign on to the free WiFi system and share their location information.²² Approximately 80% of mall visitors accepted the offer.²³
- d. A 2016 academic study concluded that only about 15% of U.S. online shoppers are privacy fundamentalists.²⁴
- e. A 2015 survey of 8,000 consumers found that more than 75% of consumers were willing to share personal data to receive coupons, cash back, or rewards from a company, and more than 50% of consumers were similarly willing to share data for other benefits such as less spam or exclusive consumer service.²⁵

24. Researchers have also examined how willingness to share data varies across demographic categories. For instance, practitioners have recognized that younger consumers are typically more willing to share personal data online,²⁶ and this finding is consistent with survey data showing that younger generations feel more comfortable with a company handling their

²¹ Data & Marketing Association and Acxiom (2018), at p. 4. It appears that the question was not asked in 2021.

²² Anindya Ghose, Beibei Li, and Siyuan Liu (2019) “Mobile Targeting Using Customer Trajectory Patterns,” *Management Science*, 65(11):5027-5049, <https://doi.org/10.1287/mnsc.2018.3188> (“Ghose et al. (2019)”).

²³ Ghose et al. (2019), at p. 5046.

²⁴ Tun-Min (Catherine) Jai and Nancy J. King (2016) “Privacy versus reward: Do loyalty programs increase consumers’ willingness to share personal information with third-party advertisers and data brokers?” *Journal of Retailing and Consumer Services*, 28:296-303, <http://dx.doi.org/10.1016/j.jretconser.2015.01.005>, at p. 302.

²⁵ Matthew Quint and David Rogers (2015) “What Is the Future of Data Sharing?” *Columbia Business School*, https://business.columbia.edu/sites/default/files-efs/imce-uploads/global_brands/The_Future_of_Data_Sharing_Columbia-Aimia_October_2015.pdf (“Quint and Rogers (2015)”), at pp. 5, 47.

²⁶ Lauren Johnson (2016) “Digital-Savvy Millennials Will Sacrifice Privacy for Personalization, Says Leo Burnett Exec,” *AdWeek*, <https://www.adweek.com/performance-marketing/digital-savvy-millennials-will-sacrifice-privacy-personalization-says-leo-burnett-exec-169869/>.

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personal data.²⁷ The 2021 survey of 2,038 U.S. adults mentioned above found that the percent of privacy fundamentalists is between 8% and 14% for age groups 18-24, 25-34, and 35-44 and between 19% and 41% for age groups 45-54, 55-64, and 65+.²⁸

25. In addition to demographic groups, a recent large-scale research study of more than 20,000 participants by Ackermann et al. (2022) demonstrated that willingness to share data also varies based on contextual factors such as the type of data requested, the intended use of the data, the industry sector a corresponding company belongs to, the amount of control over, and the degree to which the data allows for personal identification.²⁹ Consumers weigh the costs and benefits of sharing their data in each situation and are “sometimes willing to disclose personal information, although they perceive certain risks of doing so.”³⁰ As such, consumer behavior may change depending on the context (i.e., a privacy fundamentalist may be a privacy pragmatist depending on the context).³¹
26. As an example, the type of personal information requested (e.g., health-related, financial information, or geolocation data) affects one’s willingness to share. As explained by the researchers, “consumers may perceive disclosing financial information as a larger threat to privacy than sharing purchase histories or demographic information, such as gender and age.”³² As another example, consumers also consider the data collector’s industry sector (e.g., retail or education) as well as the intended use of the data (e.g., will the data be used to personalize communication or to predict future behavior).³³ Finally, the amount of perceived control a consumer has over their data (e.g., the ability to delete or anonymize their personal

²⁷ The average share of respondents answering “very” or “somewhat comfortable” to the question of how comfortable you feel about a company handling your personal data is 51% for Millennials, 44% for Generation X, 35% for Boomers, and 35% for the Silent Generation. See Quint and Rogers (2015), at p. 15.

²⁸ Global Data and Marketing Alliance (2022), at p. 7.

²⁹ Kurt Alexander Ackermann, Linda Burkhalter, Thoralf Mildenerger, Martin Frey, and Angela Bearth (2022) “Willingness to share data: Contextual determinants of consumers’ decisions to share private data with companies,” *Journal of Consumer Behaviour*, 21(2):375-386, <https://doi.org/10.1002/cb.2012> (“Ackermann et al. (2022)”), at p. 375.

³⁰ Ackermann et al. (2022), at p. 376.

³¹ Ackermann et al. (2022), at p. 376.

³² Ackermann et al. (2022), at p. 377.

³³ Ackermann et al. (2022), at p. 377.

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information) affects their willingness to share, with “the higher the perceived control, the more likely consumers are to share their personal information, even in the case of very sensitive data.”³⁴

27. Compounding this heterogeneity across demographic and contextual dimensions is the fact that users’ willingness to share personal data can change over time, which is particularly applicable to this matter given the lengthy class period.³⁵ As one survey of the literature explains, “[t]he way we construe and negotiate public and private spheres is context dependent because the boundaries between the two are murky: The rules people follow for managing privacy vary by situation, are learned over time, and are based on cultural, motivational, and purely situational criteria.”³⁶

28. Others have also shown that the willingness of users to share data varies by the type of data and context.³⁷ Trusting the organization is a top reason for making one “happy to share [] personal information with a company.”³⁸ Online surveys of U.S. consumers conducted in 2017 and 2021, discussed above, found that the proportion of U.S. consumers concerned about online privacy has fallen from 82% to 69%, the proportion of U.S. consumers comfortable with exchanging personal information with companies has increased from 44% to 51%, the proportion of U.S. consumers saying that transparency regarding the collection and use of personal data is important when sharing information with companies has declined from 84% to 67%, and the proportion of U.S. consumers that believe understandable, easy-

³⁴ Ackermann et al. (2022), at p. 377.

³⁵ Mr. Lasinski’s Figure 6 indicates that the percentage of accounts with sWAA off has decreased over time. Lasinski Report, at p. 17.

³⁶ Alessandro Acquisti, Laura Brandimarte, and George Loewenstein (2015) “Privacy and human behavior in the age of information,” *Science*, 347(6221):509-514, <https://www.science.org/doi/10.1126/science.aaa1465> (“Acquisti et al. (2015)”), at p. 511.

³⁷ Jeffrey Prince and Scott Wallsten (2022) “How much is privacy worth around the world and across platforms?” *Journal of Economics & Management Strategy*, 31:841-861, <https://doi.org/10.1111/jems.12481> (“Prince and Wallsten (2022)”), at pp. 842, 846. See, similarly, Scott J. Savage and Donald M. Waldman (2013) “The Value of Online Privacy,” *University of Colorado at Boulder Department of Economics*, <http://dx.doi.org/10.2139/ssrn.2341311> (“Savage and Waldman (2013)”), at p. 1.

³⁸ Global Data and Marketing Alliance (2022), at p. 18.

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to-read terms and conditions is important has decreased from 84% to 67%.^{39,40} Furthermore, the percentage of people who were comfortable with businesses sharing personal information with other organizations for personalized services and products has increased from 30% in 2018 to 44% in 2022.⁴¹

29. Applying the concept of changes in users’ willingness to share data over time to the current matter, there could be users who have WAA/sWAA turned off for a period of time during the class period but then turn it back on.⁴² In addition, in a January 2021 study, Google analyzed the behavior of 1% (36 million) of its users that were active within the past 28 days in the 6-month period between July 2020 and December 2020.⁴³ Of the users studied, 78% of users had exhibited no privacy behavior (i.e., had not changed any privacy settings or visited privacy products) during the 6-month period and 44% of users⁴⁴ had no privacy behavior with a longer recorded history.⁴⁵ This shows the substantial heterogeneity in privacy behavior even among Google users.
30. User perspectives on privacy can also vary with different levels of experience in a given app or environment. For instance, one survey found that “experience using mobile applications

³⁹ Global Data and Marketing Alliance (2022), at pp. 4-5, 19.

⁴⁰ In addition to research concerning consumers in the United States, I have also conducted research in Europe. Based on consumer mobile location sharing data, my co-authors and I show that even consumers in Europe are willing to share their location data in return for various benefits. In my research, my co-authors and I partnered with a large telecommunications firm in Europe which runs a mobile application (available for iOS and Android devices) that presented context-sensitive information using the mobile devices’ GPS location. See Dominik Molitor, Martin Spann, Anindya Ghose, and Philipp Reichhart (2020) “Effectiveness of Location-Based Advertising and the Impact of Interface Design,” *Journal of Management Information Systems*, 37(2):431-456, <https://doi.org/10.1080/07421222.2020.1759922>.

⁴¹ Global Data and Marketing Alliance (2022), at p. 5.

⁴² Mr. Lasinski’s own figures and discussion seem to suggest this—Mr. Lasinski’s Figure 7 reports that the percentage of U.S. accounts active at any time between July 27, 2016 and July 27, 2020 that ever had sWAA turned off was 42.53%, however, Mr. Lasinski’s Figure 6 and Schedule 13.2 suggest that the percentage of accounts with sWAA off in a given month is much lower than that, especially later in the purported class period. In addition, Mr. Lasinski uses the words “ever turned sWAA off,” and not “always turned sWAA off.” This is because he does not seem to have any evidence that these users never change during the purported class period. See Lasinski Report, ¶¶ 46-49.

⁴³ GOOG-RDGZ-00160822 at 822, 827-828.

⁴⁴ I note that GOOG-RDGZ-00160822 at 837 states that 56% of users had “No privacy behavior,” but the chart and the calculations indicate that the percentage of users with no privacy behavior is instead 44%.

⁴⁵ GOOG-RDGZ-00160822 at 831, 835-837.

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did moderate the effect of individual preferences and contextual factors on privacy judgments” and “changed the equation respondents used to assess whether data collection and use scenarios met their privacy expectations.”⁴⁶ Users’ privacy expectations become less based on individual preferences and more based on contextual factors and norms as their experience with an app or environment increased.

B. The fact that users have different valuations of their privacy relative to their valuations of personal data makes it difficult to reliably measure the value of the actual damage incurred

31. The literature also suggests that users’ valuations of privacy and valuations of personal data can differ from one another and are highly dependent on the context. As a report from the Organization for Economic Co-Operation and Development (“OECD”) explained, “people tend to differ with respect to their individual valuation of personal data (i.e., the amount of money sufficient for them to give away personal data [their willingness-to-accept (WTA)]) and their individual valuation of privacy (i.e., the amount of money they are ready to spend to protect their personal data from disclosure [their willingness-to-pay (WTP)]).”⁴⁷ Prince and Wallsten (2022) similarly state that “[m]easurement of privacy preferences is further complicated by distinctions between willingness-to-pay (WTP) for privacy versus WTA payment in exchange for disclosing otherwise private information. A substantial literature finds that WTA estimates tend to be higher than WTP estimates, and that the two measures often have little correlation”⁴⁸ Furthermore, in a field experiment, Acquisti et al. (2013) found that “[i]ndividuals assigned markedly different values to the privacy of their data depending on (1) whether they were asked to consider how much money they would accept to disclose otherwise private information or how much they would pay to protect otherwise

⁴⁶ Kirsten Martin and Katie Shilton (2016) “Why Experience Matters to Privacy: How Context Based Experience Moderates Consumer Privacy Expectations for Mobile Applications,” *Journal of the Association for Information Science and Technology*, 67(8):1871-1882, <https://doi.org/10.1002/asi.23500>, at p. 1871.

⁴⁷ OECD (2013) “Exploring the Economics of Personal Data: A Survey of Methodologies for Measuring Monetary Value,” *OECD Digital Economy Papers*, 220, <https://doi.org/10.1787/5k486qtxldmq-en> (“OECD (2013)”), at p. 5, emphasis in original.

⁴⁸ Prince and Wallsten (2022), at p. 846.

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public information and (2) the order in which they considered different offers for their data [] The results highlight the sensitivity of privacy valuations to contextual, nonnormative factors.”⁴⁹ They found that the ratio of WTP to WTA was much larger than the average ratio observed for ordinary private goods.⁵⁰

32. In a survey of 2,416 Americans, Winegar and Sunstein (2019)⁵¹ similarly found that the amount that consumers are willing to pay to maintain data privacy is much lower than what they are willing to accept in exchange for access to personal data. This discrepancy is a well-documented phenomenon in behavioral economics,⁵² but Mr. Lasinski does not discuss this discrepancy nor its implications on the reliability of his \$3 estimate in the context of his “actual damages” calculation. In particular, Mr. Lasinski appears to assume that the relevant metric for his “actual damages” calculation is the purported class members’ valuation of allowing access to their personal data (i.e., their WTA). Furthermore, Acquisti et al. (2013) caution against the “uncritical use of privacy valuations that have used single methods—for example, only WTP or only WTA. Such often surprisingly precise valuations should be interpreted with extreme caution: failing to differentiate between how much an individual would pay versus accept for private data conceals the reality of how malleable and mutable these valuations can be.”⁵³
33. The discrepancy discussed above does not only suggest that purported class members would have paid less than Mr. Lasinski’s \$3 estimate to protect their data, but also points to the inherent difficulty in estimating a reliable value that all purported class members would

⁴⁹ Alessandro Acquisti, Leslie K. John, and George Loewenstein (2013) “What Is Privacy Worth?” *Journal of Legal Studies*, 42(2):249-274, <https://doi.org/10.1086/671754> (“Acquisti et al. (2013)”), at p. 249.

⁵⁰ Acquisti et al. (2013), at pp. 267-268.

⁵¹ A.G. Winegar and C.R. Sunstein (2019) “How Much Is Data Privacy Worth? A Preliminary Investigation,” *Journal of Consumer Policy*, 42:425-440, <https://doi.org/10.1007/s10603-019-09419-y> (“Winegar and Sunstein (2019)”), at p. 425.

⁵² See Winegar and Sunstein (2019), at p. 425. See also, Shakthidhar Gopavaram, Jayati Dev, Sanchari Das, and L. Jean Camp (2021) “IoT Marketplace: Willingness-To-Pay vs. Willingness-To-Accept,” *In Proceedings of the 20th Annual Workshop on the Economics of Information Security (WEIS 2021)*, <https://ssrn.com/abstract=3867652>; Wojciech Bizon and Andrzej Poszewiecki (2016) “The Willingness to Trade Privacy in the Context of WTA and WTP,” *International Journal of Trade, Economics and Finance*, 7(4):121-124, <https://doi.org/10.18178/ijtef.2016.7.4.510>; Acquisti et al. (2013) .

⁵³ Acquisti et al. (2013), at p. 268.

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attribute to the actual damage incurred, if any. Both the OECD report and Winegar and Sunstein (2019) discussed above conclude that it is difficult to reliably estimate both WTA and WTP, and that there is significant heterogeneity across consumers in their WTA and WTP.⁵⁴

C. The “privacy paradox” makes it very difficult to accurately gauge users’ willingness to share personal data

34. What users say they want (stated preferences) is often at odds with what their behavior reveals (revealed preferences), and as discussed above, their behavior can depend on context. This is reflected in the fact that actual user choices are often inconsistent with what users say in surveys about the importance of privacy, a phenomenon recognized in the literature as the “privacy paradox.”⁵⁵ The academic literature shows that some users claim to care about the privacy of their data but most users rarely make an effort to actively protect this data and in fact often give it away voluntarily. The “privacy paradox” makes measurement of privacy concerns about WAA/sWAA-Off Data very difficult in a hypothetical setting. So even if there was a hypothetical homogeneous number that would reflect privacy data preferences for all users (which there is not), the mere identification of that number itself is an implausible task in the first place.
35. As one review of the literature explained, “when it comes to social media use [] even individuals who express concerns [about privacy] behave quite carelessly, engaging in uncensored or inappropriate self-disclosure, making a great deal of their digital footprint

⁵⁴ “[E]mpirical studies point out that both the *valuation of privacy* and the *valuation of personal data* are extremely sensitive to contextual effects,” and “cannot be measured with an absolute certainty and precision.” OECD (2013), at pp. 5, 30, emphasis in original; Winegar and Sunstein (2019), at p. 425 (“[B]oth willingness to pay and willingness to accept measures are highly unreliable guides to the welfare effects of retaining or giving up data privacy”).

⁵⁵ Acquisti et al. (2015) states that “doubts about the power of attitudinal scales to predict actual privacy behavior arose early in the literature. This discrepancy between attitudes and behaviors has become known as the ‘privacy paradox.’” Acquisti et al. (2015), at p. 510. Other authors explain, “[t]his research explores what we call the ‘privacy paradox’ or the relationship between individuals’ intentions to disclose personal information and their actual personal information disclosure behaviors.” Patricia A. Norberg, Daniel R. Horne, and David A. Horne (2007) “The Privacy Paradox: Personal Information Disclosure Intentions versus Behaviors,” *Journal of Consumer Affairs*, 41(1):100-126, <https://doi.org/10.1111/j.1745-6606.2006.00070.x>, at p. 100.

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public, and allowing a wide range of external apps to access their data.”⁵⁶ As I wrote about the privacy paradox in 2017, “[p]eople are full of contradictions” when it comes to data privacy and appear to “care a lot about data privacy,” but nevertheless are willing to share data in order to receive location-based coupons and ads⁵⁷ and, as I put it in my book, “there is a disconnect between our understanding of what it means to be privacy-conscious in the mobile economy and the actions we are taking in the real world.”⁵⁸

36. As I mention in **Section II.A** above, even purported class members that kept their WAA/sWAA off for the entirety of the class period may be users who kept other data collection settings turned on and/or used third-party apps for which they consented to providing their app activity data. Given the apparent willingness of users to share their data to enhance the user experience, any attempt to ask users to expend effort or experience a reduced user experience to achieve greater privacy may actually have little impact if users forego the effort.⁵⁹ Gerber et al. (2018) states that “survey results show that the privacy of their personal data is an important issue for online users worldwide, [but] most users rarely make an effort to protect this data actively and often even give it away voluntarily.”⁶⁰
37. As discussed above, purported class members did provide their data to the third-party apps at-issue in this case. In part, the privacy paradox results from the fact that, in the abstract,

⁵⁶ Tomas Chamorro-Premuzic and Nathalie Nahai (2017) “Why We’re So Hypocritical About Online Privacy,” *Harvard Business Review*, <https://hbr.org/2017/05/why-were-so-hypocritical-about-online-privacy> (“Chamorro-Premuzic and Nahai (2017)”).

⁵⁷ Anindya Ghose (2017) “When push comes to shove, how quickly will you give up your data for convenience?” *Quartz*, <https://qz.com/973578/data-privacy-doesnt-seem-to-be-a-concern-for-mobile-users-willing-to-swap-it-for-convenience/> (“Ghose (2017)”).

⁵⁸ Anindya Ghose (2017) “TAP: Unlocking the Mobile Economy,” *MIT Press*, Chapter 3, <https://doi.org/10.7551/mitpress/11109.003.0006>, at p. 39.

⁵⁹ “[W]henever privacy requires additional effort or comes at the cost of a less smooth user experience, participants are quick to abandon technology that would offer them greater protection. This suggests that privacy policy and regulation has to be careful about regulations that inadvertently lead consumers to be faced with additional effort or a less smooth experience in order to make a privacy-protective choice.” Susan Athey, Christian Catalini, and Catherine Tucker (2017) “The Digital Privacy Paradox: Small Money, Small Costs, Small Talk,” *National Bureau of Economic Research Working Paper*, 23488, <http://www.nber.org/papers/w23488>, at p. 18.

⁶⁰ Nina Gerber, Paul Gerber, and Melanie Volkamer (2018) “Explaining the privacy paradox: A systematic review of literature investigating privacy attitude and behavior,” *Computers & Security*, 77:226-261, <https://doi.org/10.1016/j.cose.2018.04.002> (“Gerber et al. (2018)”), at p. 226.

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users often claim to care substantially about privacy, but when faced with real-world decision-making that requires balancing privacy concerns with value generated by online activity, the calculus often favors the latter.⁶¹ Gerber et al. (2018) describe this concept as the privacy calculus: “if the anticipated benefits of data sharing exceed the costs, a user is expected to willingly give his/her data away.”⁶² In addition: “[t]he benefits someone can gain through data disclosure represent important predictors for a user’s behavioral intention as well as willingness to disclose data, either in a general way (‘perceived benefit/value’, ‘perceived usefulness’) or rather concrete (‘liked targeted ads’).”⁶³ In sum, when individuals decide to provide personal data, they often do so in exchange for perceived benefits, such as access to services, discounts, or monetary rewards. As I wrote about this, “brands who have earned consumer trust and who offer a relevant, value exchange will be given greater access to personal information.”⁶⁴

38. Another approach commonly applied in the privacy literature is to analyze whether users of a product were adequately informed by examining whether they change their behavior after purportedly undisclosed information is revealed. For instance, in one study, the authors examined whether Equifax customers behaved differently once they became aware of the data breach. The researchers found they did not: “Although many participants were aware of and concerned about the Equifax breach, few knew whether they were affected, and even fewer took protective measures after the breach.”⁶⁵ In other words, even after consumers

⁶¹ “Privacy calculus theory postulates that individuals perform a calculus between the *expected loss of privacy* and the *potential gain of disclosure*. Their final behaviour is determined by the outcome of the privacy trade-off. [] In social interactions rewards are mostly intangible and thus difficult to observe. As a result the disclosing behaviour of users often seems unreasonable and inconsistent with their privacy concerns.” Spyros Kokolakis (2017) “Privacy attitudes and privacy behavior: A review of current research on the privacy paradox phenomenon,” *Computers & Security*, 64:122-134, <https://doi.org/10.1016/j.cose.2015.07.002>, at p. 128.

⁶² Gerber et al. (2018), at p. 229.

⁶³ Gerber et al. (2018), at p. 245.

⁶⁴ Anindya Ghose (2018) “What Blockchain Could Mean for Marketing,” *Harvard Business Review*, <https://hbr.org/2018/05/what-blockchain-could-mean-for-marketing>.

⁶⁵ Yixin Zou, Abraham H. Mhaidli, Austin McCall, and Florian Schaub (2018) “I’ve Got Nothing to Lose”: Consumers’ Risk Perceptions and Protective Actions after the Equifax Data Breach,” *Fourteenth Symposium on Usable Privacy and Security, USENIX*, 197-216, <https://www.usenix.org/system/files/conference/soups2018/soups2018-zou.pdf>, at p. 197.

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learn that their data had been stolen (not just shared with another app), they very rarely did anything to limit the risk they faced. Other published studies have also used a similar methodology to analyze the adequacy of disclosure. One particular study of this nature, which evaluated user responses to news about the Cambridge Analytica incident, found that “[c]ontrary to many opinions reported in the news, the respondents in our sample did not delete their accounts, frantically change their privacy settings, or even express that much concern.”⁶⁶ Some of the named Plaintiffs confirmed in their testimony that they would not have changed any specific behavior in a but-for world and instead willingly submitted to the alleged violations of privacy.^{67,68} This suggests that class members whose behavior was similar to the named Plaintiffs would have provided their data for free in the but-for world, in which case “actual damages” for those class members would be \$0.

D. Mr. Lasinski’s “indicators” of value of app activity data to users are unreliable as benchmarks for calculating “actual damages” because they ignore user

⁶⁶ Joanne Hinds, Emma J. Williams, and Adam N. Joinson (2020) “‘It wouldn’t Happen to Me’: Privacy Concerns and Perspectives Following the Cambridge Analytica Scandal,” *International Journal of Human-Computer Studies*, 143:1-14, <https://doi.org/10.1016/j.ijhcs.2020.102498>, at p. 1.

⁶⁷ “Further, [Plaintiff Rodriguez] confirmed in testimony that he would not have changed his behavior in a but-for world because, after making his allegations in this case, he did not change any of his behavior, and instead willingly submitted to the alleged violations of privacy. And Plaintiff Harvey admitted during her deposition that she did not turn WAA on or off for any particular reason, and that she has not changed her behavior since filing this case despite the alleged violations of privacy. Finally, both Plaintiff Rodriguez and Plaintiff Harvey refused to testify when given the opportunity to do so that, if the Court rules Google’s practices are lawful, they would change any of their behavior to avoid the alleged violations of privacy.” Defendant Google LLC’s Second Supplemental Objections and Responses to Plaintiffs’ Interrogatories, Set Six, at p. 12. See also, Harvey Deposition, at pp. 244-248. Deposition of Sal Cataldo, February 17, 2022, at 42:19-43:25: “**Q.** I’m asking if you’ve changed your behavior in any way as a consequence of what you allege Google has been doing to invade your privacy? **A.** I would say I’m much more cognizant [] So I don’t know that I’ve changed a specific behavior [] **Q.** So just to make sure I understand, in response to – strike that. In terms of what behavioral changes you’ve implemented, if any, as a consequence of what you allege to be Google’s ongoing violation of your privacy, you’ve identified as one change that you check your settings more carefully now than you did before; is that fair to say? **A.** That’s fair to say. **Q.** Can you think of any other behavioral changes that you have implemented as a consequence of what you allege to be Google’s ongoing violation of your privacy? **A.** Sorry, I thought my audio cut out there. There’s none that I can articulate specifically.” See also, Deposition of Anibal Rodriguez, October 16, 2022, at 83:16-84:1, 311:8-313:9, 327:2-15, 329:11-330:6; Deposition of Julian Santiago, March 7, 2022, at 162:11-20, 176:15-178:12, 180:1-11. Defendant Google LLC’s Second Supplemental Objections and Responses to Plaintiffs’ Interrogatories, Set Six, at p. 12. See also, Harvey Deposition, at 244:16-248:19.

⁶⁸ It is important to keep in mind that the data at issue in this context was not strictly speaking personally identifiable information but rather the named Plaintiffs’ pseudonymized app traffic that was used for app analytics.

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heterogeneity in privacy concerns and data valuations and intrinsic differences in the datasets themselves

39. As discussed above in **Section II.A**, the willingness of users to share data varies by the type of data collected and several contextual factors, which implies that if there are any meaningful differences in the type or scope of data that the “indicators” of value of app activity data to users measure and collect relative to WAA/sWAA-Off Data, then the amounts based on the “indicators” are not reliable estimates.⁶⁹ Mr. Lasinski has proposed to use measures of value based on (1) Ipsos Screenwise Meter, (2) AT&T GigaPower Campaign & Internet Preferences Program, and/or (3) Nielsen Computer & Mobile Panel and SavvyConnect for his “actual damages” calculation. Mr. Lasinski has provided no direct or empirical evidence demonstrating that the data collected by the Ipsos Screenwise Meter or his other proposed “indicators” are comparable to Google’s collection of WAA/sWAA-Off Data. In fact, as I discuss below, the data collected by the “indicators” differs from WAA/sWAA-Off Data in that the “indicators” have more types of data and broader scope of data collected. Therefore, users’ concerns about privacy and valuations for personal data would differ, depending on the type and scope of data collected.

1. Ipsos Screenwise Meter

40. In fact, the Ipsos Screenwise meter data appears to be broader and more comprehensive than the WAA/sWAA-Off Data. As Mr. Lasinski acknowledges, participants in the Screenwise Panel “knowingly allow Google to track *all online activity on the device* and, in doing so, *relinquish any sense of online data privacy* – actual or perceived.”⁷⁰ For instance, the Ipsos Screenwise Meter measures any activity or keystrokes entered on the metered device (unless metering is paused), which can include Personally Identifiable Information (PII) (e.g., Social Security numbers), credit card information, as well as timestamps, phone numbers,

⁶⁹ For example, people demand “significantly more money to allow access to personal data when primed that such data includes health-related data than when primed that such data includes demographic data.” Winegar and Sunstein (2019), at p. 425. See also Ackermann et al. (2022), at pp. 376-378 for a discussion on how people’s willingness to share data is context-dependent.

⁷⁰ Lasinski Report, at ¶ 139, emphasis added.

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and network information associated with phone calls and SMS/MMS text messages.⁷¹

However, WAA/sWAA-Off Data (according to Mr. Lasinski), only includes data on “user activity on non-Google mobile applications by way of the Firebase SDK and/or Google Mobile Ads SDK while a user is signed into Google and has WAA or sWAA turned off.”⁷²

That is, it does not include any activity data or information regarding users’ phone calls or SMS/MMS text messaging activity, nor does it include all activity or keystrokes entered on a user’s device. In addition, the WAA/sWAA-Off Data does not include activity on any non-Google mobile app that does not use GA4F, whereas Ipsos Screenwise Meter does.

41. In addition, the possible uses of the Ipsos Screenwise Meter data appears to be broader and more comprehensive than that for WAA/sWAA-Off Data. The Ipsos Screenwise Meter Privacy Policy states that the data collected by the meter can be combined with other data collected by Google when the user is “using Google products and services as a Google user.”⁷³ The WAA/sWAA-Off Data is saved with pseudonymous identifiers and I understand is not combined with other data using Google user accounts.⁷⁴ As discussed in ¶¶ 25–26 above, users’ preferences about privacy depend on the context in which the data can be used.⁷⁵

⁷¹ Ipsos Screenwise Panel (2022) “Google Panel Privacy Policy,” <https://screenwisepanel.com/google-panel-privacy-policy> (“Ipsos Screenwise Panel (2022)”).

⁷² Lasinski Report, at footnote 1.

⁷³ Ipsos Screenwise Panel (2022) (“Google may combine the data collected with other data collected by Google when you’re using Google products and services as a Google user. For example, we may combine your panel data with information in your Google Account(s) (e.g., which ads you viewed), or with anonymous or pseudonymous identifiers (such as cookies or unique device identifiers) used by Google products and services.”)

⁷⁴ See, e.g., Defendant Google LLC’s Fourth Supplemental Responses and Objections to Plaintiffs’ Interrogatories, Set One, *Anibal Rodriguez and Julie Anna Muniz v. Google LLC, et al.*, United States District Court, Northern District of California, San Francisco, July 14, 2020 (“Defendant Google LLC’s Fourth Supplemental Responses and Objections to Plaintiffs’ Interrogatories, Set One”), at p. 25 stating that “[i]f any aspect of the consent check fails, the user data is not stored in GAIA space, and the DSIS/IDFA is deleted” and “[f]rom the signed-in GAIA copy of data, Google removes all pseudonymous identifiers. From the signed-out pseudonymous log, Google removes all signed-in identifiers.”

⁷⁵ For example, Prince and Wallsten (2022), at pp. 842, 846. See, similarly, Savage and Waldman (2013), at p. 1. Also, Mehrdad Koohikamali, Natalie Gerhart, and Mohammadreza Mousavizadeh (2015) “Location disclosure on LB-SNAs: The role of incentives on sharing behavior,” *Decision Support Systems*, 71:78-87, <https://doi.org/10.1016/j.dss.2015.01.008> (“Koohikamali et al. (2015)”) found that users’ have a more positive attitude about sharing data when they perceive that there is a societal benefit for doing so.

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42. The difference in scope and type of data collected and between the two sources renders the “one-size-fits-all” payments made to users under the Ipsos Screenwise Meter data unreliable as a benchmark for calculating the damages based on the WAA/sWAA-Off Google Analytics for Firebase Data.

2. AT&T GigaPower Campaign & Internet Preferences Program

43. Mr. Lasinski’s arguments about using “Users’ willingness to pay to prevent data collection” using the “AT&T GigaPower Campaign & Internet Preferences Program” example is also flawed and unreliable because it ignores the fact that many users are willing to share their data with firms in return for various benefits such as lower prices. The fact that AT&T offered a lower price indicates that at least some users are willing to provide their data in exchange for benefits, e.g., a lower price. This confirms the substantial heterogeneity that exists in users’ valuations for data and preferences for privacy.
44. In addition, Mr. Lasinski has provided no direct or empirical evidence demonstrating that the AT&T Internet Preference program data are comparable to the WAA/sWAA-Off Data, which, if found to be meaningfully different, would render the payments made to users in the AT&T Internet Preference program unreliable as a benchmark for calculating damages from the WAA/sWAA-Off Data. As a preliminary matter, this program was only available in a limited geographic area and for a limited period of time.⁷⁶ Importantly, in contrast with the WAA/sWAA-Off Data, the data collected by the AT&T Internet Preference program is associated with personal identifiers and used to deliver advertisements through websites, email, and direct mail,⁷⁷ whereas the WAA/sWAA-Off Data is treated pseudonymously.⁷⁸ Mr. Lasinski has not explained if and how these data and the uses of the data are comparable to the WAA/sWAA-Off Data.

⁷⁶ Lasinski Report, at ¶¶ 144-146.

⁷⁷ Jon Brodtkin (2015) “AT&T’s plan to watch your Web browsing—and what you can do about it,” *Ars Technica*, <https://arstechnica.com/information-technology/2015/03/atts-plan-to-watch-your-web-browsing-and-what-you-can-do-about-it/>.

⁷⁸ Defendant Google LLC’s Fourth Supplemental Responses and Objections to Plaintiffs’ Interrogatories, Set One, at p. 9.

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3. Nielsen Computer & Mobile Panel and SavvyConnect

45. Mr. Lasinski has provided no direct or empirical evidence demonstrating that the data collected from the Nielsen Computer & Mobile Panel or users of SavvyConnect are comparable to the WAA/sWAA-Off Data.
46. The Nielsen Computer & Mobile Panel uses metering equipment and software installed on devices to collect information about the TV, web, mobile, and audio content that users consume, which includes web browsing activity, app usage, video streaming and downloading, and radio content.⁷⁹ The data is used for market research, reports, and analyses, but it is not used to directly provide advertisements to users.⁸⁰ Additionally, personally identifiable information may be collected in combination with other identifying information.⁸¹ As discussed above, users’ preferences about privacy depend on the context in which the data can be used. Mr. Lasinski has not explained if and how these data and the uses of the data are comparable to the WAA/sWAA-Off Data.
47. SavvyConnect is an application that can be installed on smartphones, desktops, and tablets to collect device, web, and app data, including device status, mobile and Wi-Fi networks used, web browsing, app installations and usage, online searches, media consumption, shopping habits, form entries, downloads and uploads, advertisements, cookies, and web content and interactions.⁸² The collected data is used for market research, and survey responses from SurveySavvy are only associated with pseudonymous respondent identifiers and are not associated with Personal Identifiable Information without opt-in consent from users.⁸³ Again, Mr. Lasinski has not explained if and how these data, and the uses of the data are sufficiently comparable to the WAA/sWAA-Off Data.

⁷⁹ Nielsen Computer & Mobile Panel (2022) “NIELSEN U.S. PANEL PRIVACY NOTICE SUMMARY,” <https://computermobilepanel.nielsen.com/ui/US/en/privacypolicyen.html>, (“Nielsen Computer & Mobile Panel (2022)”).

⁸⁰ Nielsen Computer & Mobile Panel (2022).

⁸¹ Nielsen Computer & Mobile Panel (2022).

⁸² SurveySavvy (2023) “What is SavvyConnect?” <https://surveysavvy.com/savvyconnect/>; SurveySavvy (2023) “Privacy Policy,” <https://surveysavvy.com/privacy-policy/>.

⁸³ SurveySavvy (2023) “Privacy Policy,” <https://surveysavvy.com/privacy-policy/>.

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48. The above points imply that the payments made to users in the Nielsen Computer & Mobile Panel or users of the SavvyConnect app would be unreliable as a benchmark for calculating damages from the WAA/sWAA-Off Data since Mr. Lasinski has not explained if and how these data are comparable to WAA/sWAA-Off Data.
49. In summary, notwithstanding the difficulty in determining users’ valuations of personal data and privacy, the information that Mr. Lasinski relies upon in an attempt to establish “actual damages” is unreliable for that purpose. Just because Google pays Ipsos Screenwise Meter panel participants \$3 does not inform us whether purported class members’ WTA is \$3, less than \$3, or even \$0, for Google’s collection of WAA/sWAA-Off Data. If some purported class members’ willingness-to-accept is in fact \$0, and they were to receive \$3 in “actual damages” award, then they would receive a windfall gain of \$3, i.e., they receive \$3 but were actually damaged \$0. Mr. Lasinski has not provided any evidence for his assumption that any, much less that all purported class members’ willingness-to-accept is \$3. In fact, his measure of \$3 does not account for the heterogenous user preferences or heterogeneous valuations for data privacy I have discussed above. As a result, Mr. Lasinski’s “actual damages” estimate is fundamentally flawed, unscientific and hence unreliable.

III. MR. LASINSKI FAILS TO DEMONSTRATE THAT HE HAS ACCOUNTED FOR THE BENEFITS USERS CAN DERIVE FROM GA4F IN HIS “ACTUAL DAMAGES” CALCULATIONS BASED ON THE IPSOS SCREENWISE PANEL, THEREBY RENDERING HIS OPINION UNRELIABLE

50. Google and third-party app developers’ collection of GA4F app analytics data provides several benefits to users, which should be accounted for in Mr. Lasinski’s “actual damages” but are not. As Mr. Lasinski acknowledges in his report, GA4F helps app developers create a better user experience, which ultimately benefits consumers by providing them with a more satisfactory and delightful app experience.⁸⁴ Mr. Lasinski’s “actual damages” measure should subtract the value that users receive from GA4F from the value that Google would have to pay users to receive users’ data, especially considering that I understand users typically agree to terms of service with an app that explain that they are providing data for

⁸⁴ Lasinski Report, at ¶ 38.

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use by analytics provider(s) of the free app.⁸⁵ It is conceivable that at least some users are cognizant that the use of a free app often implies exchanging their data with the app developer and/or with other entities.⁸⁶

51. Academic literature has shown that users are more willing to provide their user data when they perceive benefits from sharing that data, for example, through improved service quality or scope, consistent with the privacy calculus theory discussed above. For example, Lee et al. (2013) find that “both expected benefit and expected risk significantly influenced users’ intention to share.”⁸⁷ Keith et al. (2013) similarly find that perceived benefits from using a new mobile app increase users’ intent to disclose information through the app, and users’ “[p]erceived benefits and risks are [an] efficient way of predicting the actual privacy settings decided upon.”⁸⁸ Finally, Koohikamali et al. (2015) found that users’ have a more positive attitude about sharing data when they perceive that there is a societal benefit for doing so.⁸⁹
52. Users provide data to third-party apps that use GA4F, which can be used to generate benefits for users in several ways. Google refers to this as the “[v]irtuous cycle of value,” where the data are used by developers to “improve app stability, personalize their apps, and engage their users,” and by Google to enhance products and features, resulting in “[e]nd-

⁸⁵ See ¶ 20 above.

⁸⁶ “If consumers were given the choice to pay for the free apps and online services they use in exchange for withholding all of their personal data, they would probably decline, preferring instead to pay *with* their personal data.” Chamorro-Premuzic and Nahai (2017), emphasis in original. See also, Ghose (2017). See also, Lee Rainie and Maeve Duggan (2016) “Privacy and Information Sharing,” *Pew Research Center*, <https://www.pewresearch.org/internet/2016/01/14/privacy-and-information-sharing/>, (“Free is a good price. The social media scenario, in particular, drew a number of short answers that made clear people like no-cost services. One focus group participant explained why he was comfortable letting a technology company know about him in return for free email service”). See also, Verena M. Wottrich, Eva A. van Reijmersdal, and Edith G. Smit (2018) “The privacy trade-off for mobile app downloads: The roles of app value, intrusiveness, and privacy concerns,” *Decision Support Systems*, 106:44-52, <https://doi.org/10.1016/j.dss.2017.12.003>.

⁸⁷ Haein Lee, Hyejin Park, and Jinwoo Kim (2013) “Why do people share their context information on Social Network Services? A qualitative study and an experimental study on users’ behavior of balancing perceived benefit and risk,” *International Journal of Human-Computer Studies*, 71(9):862-877, <https://doi.org/10.1016/j.ijhcs.2013.01.005>, at p. 871.

⁸⁸ Mark J. Keith, Samuel C. Thompson, Joanne Hale, Paul Benjamin Lowry, and Chapman Greer (2013) “Information disclosure on mobile devices: Re-examining privacy calculus with actual user behavior,” *International Journal of Human-Computer Studies*, 71(12):1163-1173, <https://doi.org/10.1016/j.ijhcs.2013.08.016>, at p. 1170.

⁸⁹ Koohikamali et al. (2015), at pp. 80, 83.

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users enjoy[ing] more stable apps and relevant, personalized experiences.”⁹⁰ Google further explains that “[t]hrough the concepts of ‘data sharing’ and ‘linking’, the data for a given app becomes actionable – allowing the developer to target ads, push notifications, configurations, and A/B tests to their users based on their Analytics data.”⁹¹ User benefits generated by GA4F data include:

- a. **Improved User Experience:** By collecting data on how users interact with the app and various events in the app, developers can identify areas that need improvement and make necessary changes to enhance the user experience. This can lead to a more intuitive and enjoyable experience for consumers.⁹²
- b. **Better Performance Monitoring:** Firebase Analytics helps developers measure app performance, including crashes, latency, and other errors, and quickly address issues that could affect the user experience. Firebase Analytics integrates with other Firebase services, such as Crashlytics, which helps developers identify and fix app crashes and other errors. This can result in a faster and more reliable app experience for consumers.
- c. **Better Products:** GA4F provides free, unlimited reporting on up to 500 distinct events.⁹³ By analyzing behavior and feedback of app users, app developers can use the insights gained from Firebase Analytics to make informed decisions about product development and create better products that meet the needs of their target audience.⁹⁴ According to Google, “GA for Firebase allows sharing Analytics data with Google for improving Google products and services, enabling technical support, benchmarking, and sharing with Account Specialists.”⁹⁵

⁹⁰ See GOOG-RDGZ-00059723, at 724.

⁹¹ See GOOG-RDGZ-00059723, at 724.

⁹² See GOOG-RDGZ-00059723, at 724.

⁹³ Google Firebase (2023) “Google Analytics,” <https://firebase.google.com/docs/analytics>.

⁹⁴ See also GOOG-RDGZ-00059723, at 724.

⁹⁵ Defendant Google LLC’s Fourth Supplemental Responses and Objections to Plaintiffs’ Interrogatories, Set One, at p. 28.

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53. Users can also benefit from Google’s collection of WAA/sWAA-Off Data.⁹⁶ For example, improvements include items related to Google’s products and services, such as fraud and spam detection.⁹⁷ This is also confirmed by Google’s “virtuous cycle of value” as described earlier.⁹⁸ Additionally, the data can be used to “[m]ake recommendations to optimize use of Firebase services” as well as “[m]aintain and improve Firebase services.”⁹⁹

IV. CONCLUSION

54. Mr. Lasinski’s “actual damages” analyses ignore several key factors relevant to his conclusions. In particular, Mr. Lasinski’s “actual damages” method ascribes the same dollar value of WAA/sWAA-Off Data to all users in the purported class. This approach ignores (a) heterogeneity in individuals’ valuations for data and concerns about privacy (or lack of concerns about privacy), which I discuss in **Section II.A**; (b) intrinsic differences in individuals’ valuations of their privacy relative to their valuations of personal data, making it difficult to reliably measure the value of the actual damage incurred, which I discuss in **Section II.B**; and (c) the difficulty in accurately gauging users’ willingness to share their personal data, which I discuss in **Section II.C**. These critical limitations render his analyses fundamentally flawed, unscientific and hence unreliable.

55. Furthermore, Mr. Lasinski’s proposal to use measures of value based on (1) Ipsos Screenwise Meter; (2) AT&T GigaPower Campaign & Internet Preferences Program; (3) Nielsen Computer & Mobile Panel; and (4) SavvyConnect as “indicators” of the value of app activity data is also flawed. As I discuss in **Section II.D**, these “indicators” are unreliable as benchmarks for calculating “actual damages” because they ignore user heterogeneity, in privacy concerns and data valuations, and intrinsic differences in the

⁹⁶ Google Firebase (2023) “Privacy and Security in Firebase,” <https://firebase.google.com/support/privacy>; Defendant Google LLC’s Fourth Supplemental Responses and Objections to Plaintiffs’ Interrogatories, Set One. See also, GOOG-RDGZ-00059723, at 724.

⁹⁷ GOOG-RDGZ-00208099, at 104 noting that “Advertising ID, and related derived attributes, are among many signals utilized by Google’s AdSpam team for IVT [invalid traffic] detection” and at comment 94 explaining that “AdSpam is able to use the ADID even when users opt out.”

⁹⁸ See ¶ 52 above.

⁹⁹ Google Firebase (2023) “Privacy and Security in Firebase,” <https://firebase.google.com/support/privacy>.

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datasets themselves. Mr. Lasinski has provided no direct or empirical evidence demonstrating that the data collected by the Ipsos Screenwise Meter or his other proposed “indicators” are comparable to Google’s collection of WAA/sWAA-Off Data.

56. In addition, as I discuss in **Section III**, Mr. Lasinski ignores user benefits received from providing app analytics data to Google and third-party app developers, which should have been accounted for in his “actual damages,” but are not. These benefits include improved user experience, better performance monitoring, and better products. Users provide data to third-party apps that use GA4F, which is in turn used by developers and Google to improve app stability and spam detection and execute advertising experiments. In fact, academic literature for more than two decades has shown that many users are willing to provide their data when they perceive various benefits from sharing that data.



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ACADEMIC EXPERIENCE

5/2017 – Present	NYU Stern School of Business Heinz Riehl Chair Professor of Business
5/2013 – 4/2017	NYU Stern School of Business Professor of Technology, Operations, and Statistics and Professor of Marketing NEC Faculty Fellow
4/2017 – Present	NYU Stern School of Business Director, Masters of Business Analytics (MSBA) Program
5/2016 – Present	NYU Stern School of Business Co-Director, Masters of Business Analytics (MSBA) Capstone
2/2016 – Present	NYU Stern School of Business Stern Faculty Scholar
8/2012 – 4/2017	NYU Stern School of Business Director, Center for Business Analytics (CBA)
9/2013 – 12/2014	NYU Co-Chair, NYU-AIG Partnership on Innovation for Global Resilience
5/2010 – 4/2013	NYU Stern School of Business Associate Professor (with tenure) Robert L. & Dale Atkins Rosen Faculty Fellow Daniel Paduano Fellow
8/2011 – 7/2012	Wharton School of Business, University of Pennsylvania Visiting Professor
1/2011 – 6/2012	NYU Stern School of Business Co-Director, Center for Digital Economy Research (CeDER)
9/2004 – 4/2010	NYU Stern School of Business Assistant Professor

EDUCATION

2004	Tepper School of Business, Carnegie Mellon University, USA Ph.D. Information Systems
2002	Tepper School of Business, Carnegie Mellon University, USA M.S. Information Systems
1998	Indian Institute of Management, Calcutta, India M.B.A. Finance, Marketing, & Information Systems
1996	National Institute of Technology (NIT) Jalandhar, India B.Tech. Instrumentation & Control Engineering

APPENDIX A**SELECTED ACADEMIC HONORS AND AWARDS**

- **2022** AIS Fellow Award
- **2022** Distinguished Alumni Award IIM Calcutta
- **2022** Best Impact Paper Award, International Conference on Information Systems (ICIS)
- **2022** Best Dissertation Award, Workshop on Information Technology Systems (WITS)
- **2022** Best Student Paper Finalist, WISE (Workshop on Information Systems Economics)
- **2022** INFORMS ISS Nunamaker-Chen Best Dissertation Runner Up Award
- **2022** Best Paper Award Finalist, Management Science (IS Department)
- **2021** Best Student Paper Award, International Conference on Information Systems (ICIS)
- **2021** Best Paper Runner Up Award, Information Systems Research (ISR)
- **2021** Nominated for CSWIM 2021 Best Paper Award
- **2020** INFORMS IS Practical Impact Award
- **2020** Best Paper Award Finalist, Management Science
- **2020** Appointment as Department Editor (IS) of Management Science
- **2019** Top 1% Highest Cited Researcher Recognition by Thomson Reuters
- **2019** Best Paper Award, Workshop in Information Technology Systems (WITS)
- **2019** NYU Stern Schoolwide Distinguished Teaching Award
- **2018** Axiom Business Book Gold Award for TAP in Business Technology category
- **2018** Axiom Business Book Bronze Award for TAP in Economics category
- **2018** Nominated for Best Paper, INFORMS-CIST conference
- **2018** Nominated for Information Systems Research Best Paper Award
- **2017** Thinkers50 Distinguished Achievement Nomination (Digital Thinker Award)
- **2017** Thinkers50 Radar Award for Top 30 Management Thinkers Globally
- **2017** POMS Healthcare Best Student Paper Award Finalist
- **2016** Best Student Paper Award in Workshop on Health IT and Economics (WHITE)
- **2016** National Science Foundation EAGER Award
- **2015** Distinguished Fellow Award from INFORMS Information Systems Society.
- **2015** Nominated for Best Paper, INFORMS-CIST conference
- **2015** Best Paper Award in MIS Quarterly for 2015
- **2015** Best AIS Paper Award from Association of Information Systems
- **2015** NET Institute Grant
- **2015** Marketing Science Institute Award
- **2015** Adobe Faculty Research Award
- **2014** Best Paper Award in Management Science IS department from the last 3 years (2011-2013)
- **2014** Best Paper Award in Information Systems Research for 2014
- **2014** Best Overall Conference Paper Award, American Marketing Association Conference
- **2014** Best Digital Marketing Track Paper Award, American Marketing Association Conference
- **2014** Kauffman Foundation Grant
- **2014** Selected For “Top 40 under 40 Business School Professors Worldwide” by Poets & Quants
- **2014** Selected For “Top 200 Thought Leaders in Big Data and Business Analytics” by Analytics Week

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- **2013** Google Faculty Research Award
- **2012** Best Theme Paper Award, International Conference on Information Systems (ICIS)
- **2012** Marketing Science Institute Award
- **2012** SEI-Wharton Future of Advertising Grant
- **2012** Institute on Asian Consumer Insights Award
- **2012** Google Faculty Research Award
- **2012** NET Institute Grant
- **2012** NYU Abu Dhabi Institute Seed Grant
- **2011** Best Paper Award, Workshop on Health IT and Economics (WHITE)
- **2011** Daniel P. Paduano Fellowship at NYU Stern
- **2011** Delphi Big Think Fellowship
- **2011** Best Paper Award, 20th International World Wide Web Conference (WWW)
- **2011** Marketing Science Institute Young Scholar
- **2011** NYU Abu Dhabi Institute Seed Grant
- **2010** Google-WPP Marketing Research Award
- **2010** National Science Foundation IGERT Award
- **2010** MSI-Wharton Interactive Media Initiative (WIMI) Award
- **2009** Meritorious Service Award (Associate Editor) for Management Science.
- **2009** MSI-Wharton Interactive Media Initiative (WIMI) Award
- **2009** NYU-Poly Research Award
- **2009** National Science Foundation SFS ASPIRE Award
- **2009** NYU Stern Center for Japan-US Business and Economics Studies Grant
- **2008** Best Paper Award Nominee, Workshop on Information Technology and Systems (WITS)
- **2008** NET Institute Grant
- **2007** Best Track Paper Award (WISA) International Conference on Information Systems
- **2007** Best Paper Award Nominee International Conference on Information Systems
- **2007** Best Published Paper Runner Up Award in *Information Systems Research*
- **2007** Marketing Science Institute Award
- **2007** Microsoft Virtual Earth Award
- **2007** National Science Foundation CAREER Award
- **2006** Microsoft Live Labs Award
- **2006** NET Institute Grant
- **2005** ACM SIGMIS Doctoral Dissertation Award. (1st Runner-Up)
- **2005** Best Paper Award Nominee Hawaiian International Conference on System Sciences (HICSS)
- **2004** Best Paper Award Nominee, International Conference on Information Systems (ICIS)
- **2003** Doctoral Consortium Fellow, International Conference on Information Systems
- **2000** William Larimer Doctoral Fellowship at Carnegie Mellon University

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REFEREED JOURNAL PUBLICATIONS

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2. Ghose, A., H.A. Lee, Y. Son, and W. Oh. 2023. Leveraging the Digital Tracing Alert in Virus Fight: The Impact of COVID-19 Cell Broadcast on Population Movement, forthcoming, *Information Systems Research*.
3. Meghanath M., B. Li, N. Foutz, and A. Ghose. 2023. Personalized Privacy Preservation in Consumer Mobile Trajectories, forthcoming, *Information Systems Research*.
 - **WITS 2019 Best Paper Award**
4. Xu, Y., B. Lu, A. Ghose, H. Dai, and W. Zhou. 2023. The Interplay of Earnings, Ratings, and Penalties on Sharing Platforms: An Empirical Investigation, forthcoming, *Management Science*.
5. Xu, Y., A Ghose, and B. Xiao. 2023. Mobile Payment Adoption: An Empirical Investigation on Alipay, forthcoming, *Information Systems Research*.
6. Joo, M., S. Kim, A. Ghose, and K. Wilbur. 2022. Designing Distributed Ledger Technologies, like Blockchain, for Advertising Markets, forthcoming, *International Journal of Research in Marketing*.
7. Fernandez, C, M. Cohen, and A. Ghose. 2022. **Evolution of Referrals over Customers' Life Cycle: Evidence from a Ride-Sharing Platform**, forthcoming, *Information Systems Research*.
8. Ghose, A., X. Guo, B. Li, and Y. Dang. 2022. Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment, *MIS Quarterly*, (46:1), 151-192.
9. Adamopolous, P., A. Ghose, and A. Tuzhilin. 2022. Heterogeneous Demand Effects of Recommendation Strategies in a Mobile Application: Evidence from Econometric Models and Machine-Learning Instruments, *MIS Quarterly*, (46:1), 101-150.
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 - **Finalist, 2017 POMS Healthcare Best Student Paper Award**
 - **Best Student Paper Award, 2016 Workshop on Health IT and Economics (WHITE)**
12. Cui, T, A. Ghose, H. Halaburda, R. Iyengar, K. Pauwels, S .Sriram, C. Tucker, and S. Venkataraman. 2020. Informational Challenges in Omnichannel Marketing: Remedies and Future Research, *Journal of Marketing*, 85(1), 103-120.
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15. Molitor, D., Spann, M., Ghose, A., and P. Reichhart. 2020. Effectiveness of Location-Based Advertising and the Impact of Interface Design. *JMIS*.
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39. Chan, J. and A. Ghose. 2012. Internet's Dirty Secret: Assessing the Impact of Online Intermediaries on the Outbreaks of STDs, ***National Bureau of Economic Research Summer Meetings, Boston.***
40. Chan, J. and A. Ghose. 2012. Internet's Dirty Secret: Assessing the Impact of Online Intermediaries on the Outbreaks of STDs, ***Statistical Challenges in E-Commerce Research (SCECR), Montreal.***
41. Ghose, A., and S. Han. 2012. Mobile Advertising and App Adoption in the New Mobile Economy, ***Statistical Challenges in E-Commerce Research (SCECR), Montreal.***
42. Ghose, A., P. Ipeirotis, and B. Li. 2012. Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content, ***Research Frontiers in Marketing Science Conference, University of Texas at Dallas, February.***
43. Ghose, A., P. Ipeirotis, and B. Li. 2011. Examining the Impact of Search Engine Ranking and Personalization on Consumer Behavior: Combining Bayesian Modeling with Randomized Field Experiments. ***Workshop on Information Systems and Economics (WISE), Shanghai, December.***
44. Ghose, A., A. Goldfarb, and S. Han. 2011. How is the Mobile Internet Different? Search Costs and Local Activities. ***Summer Institute of Competitive Strategy, UC Berkeley, July.***
45. Ghose, A., A. Goldfarb, and S. Han. 2011 How is the Mobile Internet Different? Search Costs and Local Activities. ***Searle Research Symposium on the Economics and Law of Internet Search, Northwestern University, June.***

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46. Ghose, A., A. Goldfarb, and S. Han. 2011. How is the Mobile Internet Different? Search Costs and Local Activities. *Statistical Challenges in E-Commerce Research (SCECR)*, University of Arizona, June.
47. Chan, J., A. Ghose. 2011. Examining the Antecedents and Consequences of Disclosing Medical Privacy Information Online. - *Winter Conference on Business Intelligence*, University of Utah, Salt Lake City, March.
48. Ghose, A., A. Goldfarb, and S. Han. 2010. Search Costs and Benefits on the Mobile Internet: An Empirical Analysis of Microblogging Behavior. *Workshop on Information Systems and Economics (WISE)*, St. Louis, December.
49. Huang, Y., P. Singh, and A. Ghose. 2010. An Empirical Analyses of Dynamics in Enterprise Social Media. *Workshop on Information Systems and Economics (WISE)*, St. Louis, December.
50. Ghose, A., P. Ipeirotis, and B. Li. 2010. Estimating Demand in the Hotel Industry by Mining User-Generated and Crowd-Sourced Content. *NBER IT Economics & Productivity Workshop*, Boston, July.
51. Ghose, A. and S. Han. 2010. A Dynamic Structural Model of User Learning in Mobile Media Content. *Stanford Institute of Theoretical Economics (SITE)*, Stanford University, July.
52. Ghose, A., P. Ipeirotis, and B. Li. 2010. Estimating Demand in the Hotel Industry by Mining User-Generated and Crowd-Sourced Content. *Marketing Science Conference*, Cologne, June.
53. Ghose, A., P. Ipeirotis, and B. Li. 2010. Estimating Demand in the Hotel Industry by Mining User-Generated and Crowd-Sourced Content. *Searle Research Symposium on the Economics and Law of Internet Search*, Northwestern University, June.
54. Ghose, A., P. Ipeirotis, and B. Li. 2010. Estimating Demand in the Hotel Industry by Mining User-Generated and Crowd-Sourced Content. *Customer Insights Conference*, Yale University, May.
55. Ghose, A. and S. Han. 2009. A Dynamic Structural Model of User Learning in Mobile Media Content. *MSI-WIMI Conference*, University of Pennsylvania, Philadelphia, December.
56. Ghose, A. and S. Han. 2009. A Dynamic Structural Model of User Learning in Mobile Media Content, *SIEPR-Microsoft Conference*, Stanford University, September.
57. Ghose, A. and S. Han. 2009. A Dynamic Structural Model of User Learning in Mobile Media Content. *INFORMS Marketing Science Conference*, Ann Arbor, Michigan, June.
58. Combining Text mining with Econometrics: Monetization of User-Generated Content and Online Advertising. *CITI Conference on User-Generated Content 3.0*, Columbia University, April.
59. Ghose, A., and S. Yang. 2009. Modeling and Estimating the Relationship Between Paid and Organic Search Advertising. *Conference on the Economics of Software & Internet Industries*, Toulouse, January.
60. Ghose, A., and S. Yang. 2008. Organic vs. Paid Search Advertising. *Workshop on Information Systems and Economics (WISE)*, Paris, December.
61. Ghose, A., and S. Yang. 2008. Modeling and Estimating the Relationship Between Paid and Organic Search Advertising. *FTC and North-Western Microeconomics Conference*, Washington DC, November.
62. The Dimensions of Reputation in Electronic Markets, *INFORMS Annual Meeting*, Washington DC, October.
63. Ghose, A. and S. Yang. 2008. An Empirical Analysis of Sponsored Search Performance in Search Engine Advertising. *International Industrial Organization Conference*, Washington DC, May.
64. Ghose, A., and S. Yang. 2008. An Empirical Analysis of Sponsored Search Performance in Search Engine Advertising, *Research Frontiers in Marketing Science Conference*, University of Texas at Dallas, February.

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65. Ghose, A., and S. Yang. 2008. An Empirical Analysis of Search Engine Advertising: Sponsored Search and Cross-Selling in Electronic Markets, *Leveraging Online Media and Online Marketing*, Marketing Science Institute. February.
66. Ghose, A., and S. Yang. 2007. An Empirical Analysis of Sponsored Search Performance in Search Engine Advertising, *Workshop on Information Systems and Economics (WISE 2007)*, December.
67. Ghose, A., and P. Ipeirotis. 2007. Designing Novel Review Ranking Systems: Predicting Usefulness and Impact of Reviews. *Proceedings of the Ninth International Conference on Electronic Commerce (ICEC)*, Minnesota, August.
68. Ghose, A., and S. Yang. 2007. An Empirical Analysis of Paid Placement in Online Keyword Advertising. *Proceedings of the Ninth International Conference on Electronic Commerce (ICEC)*, Minnesota, August.
69. Ghose, A., M. Smith, and R. Telang. 2007. Internet Exchanges for Used Books: An Empirical Analysis of Product Cannibalization and Welfare Implications. *Conference on Operational Excellence in Retailing*, Harvard Business School, June.
70. Ghose, A., and P. Ipeirotis. 2007. Designing Novel Review Ranking Systems on the Web: Combining Economics with Opinion Mining. *Third Research Symposium on Statistical Challenges in E-Commerce Research (SCECR)*, University of Connecticut, May.
71. Ghose, A., and O. Yao. 2007. Goodbye Price Dispersion? New Evidence from Transaction Prices in Electronic Markets. *Third Research Symposium on Statistical Challenges in E-Commerce Research (SCECR)*, University of Connecticut, May.
72. Forman, C., A. Ghose and A. Goldfarb. 2007. Geography and Ecommerce: Measuring Convenience, Selection and Price. *International Industrial Organization Conference*, Savannah, April.
73. Archak, N., A. Ghose and P. Ipeirotis. 2007. Towards Automating the Pricing Power of Product Attributes: An Analysis of Online Product Reviews. *Winter Business Intelligence Conference*, Utah, February.
74. Forman, C., A. Ghose and A. Goldfarb. 2007. Geography and Ecommerce: Measuring Convenience, Selection and Price. *DIS Workshop*, University of Florida, January.
75. Ghose, A. and P. Ipeirotis. 2007. Designing Trusted Ranking Systems for Consumer Reviews: Combining Economics with Opinion Mining. *DIMACS Workshop on Economics of Information Security*, Rutgers University, January.
76. Ghose, A. and P. Ipeirotis. 2007. Designing Ranking Systems for Consumer Reviews: The Economic Impact of Customer Sentiment in Electronic Markets. *Proceedings of the 2007 International Conference on Decision Support Systems (ICDSS 2007)*, IIM Kolkata, January.
77. Forman, C., A. Ghose and A. Goldfarb. 2007. Geography and Ecommerce: Measuring Convenience, Selection and Price. *HICSS 20th Anniversary Symposium on Competitive Strategy, Economics, and Information Systems*, Hawaii, January.
78. Ghose, A. and B. Gu. 2006. Estimating Menu Costs in Electronic Markets. *International Symposium on Information Systems (ISIS 2006)*, India, December.
79. Ghose, A., P. Ipeirotis and A. Sundararajan. 2006. The Dimensions of Reputation in Electronic Markets. *International Symposium on Information Systems (ISIS 2006)*, India, December.
80. Forman, C., A. Ghose and A. Goldfarb. 2006. The Impact of Geographical Location on Consumer Use of Electronic Markets. *International Symposium on Information Systems (ISIS 2006)*, India, December.
81. Ghose, A. and B. Gu. 2006. Is Consumer Demand Kinked? Estimating Menu Costs and Search Costs in Electronic Markets. *Workshop on Information Systems and Economics (WISE 2006)*, Northwestern University, Evanston, December.

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82. Ghose, A., T. Mukhopadhyay, and U. Rajan. 2006. Impact of Internet Referral Services on the Supply Chain. *INFORMS Annual Meeting, Pittsburgh, Pennsylvania, November.*
83. Ghose, A. and B. Gu. 2006. Is Consumer Demand Kinked? Estimating Menu Costs and Search Costs in Electronic Markets. *INFORMS Annual Meeting, Pittsburgh, Pennsylvania, November.*
84. Ghose, A., K. Huang and A. Sundararajan 2006. Versions and Successive Generations: An Analysis of Product Line Strategies and Cannibalization in Software Markets. *INFORMS Annual Meeting, Pittsburgh, Pennsylvania, November.*
85. Ghose, A. and O. Yao. 2006. Price Dispersion on the Internet: New Evidence from Transaction Prices in B2B Electronic Markets. *INFORMS Annual Meeting, Pittsburgh, Pennsylvania, November.*
86. Forman, C., A. Ghose and A. Goldfarb. 2006. The Impact of Location on Consumer Purchases in Electronic Markets. *INFORMS Annual Meeting, Pittsburgh, Pennsylvania, November.*
87. Ghose, A. 2006. Information Uncertainty in Electronic Markets: An Empirical Analysis of Trade Patterns and Adverse Selection. *Proceedings of ZEW Workshop on ICT, Germany, October.*
88. Ghose, A. and K. Huang. 2006. Personalized Pricing and Quality Design. *INFORMS Marketing Science Conference, Pittsburgh, Pennsylvania, June.*
89. Forman, C., A. Ghose and A. Goldfarb. 2006. The Impact of Location on Consumer Purchases in Electronic Markets. *INFORMS Marketing Science Conference, Pittsburgh, Pennsylvania, June.*
90. Ghose, A. and B. Gu. 2006. Measuring Menu Costs of Online Retailers. *INFORMS Marketing Science Conference, Pittsburgh, Pennsylvania, June.*
91. Forman, C., A. Ghose and A. Goldfarb. 2006. The Impact of Location on Consumer Purchases in Electronic Markets. *Conference on Operational Excellence in Retailing. Wharton School, June.*
92. The Dimensions of Reputation in Electronic Markets. *Decision and Information Sciences Workshop, University of Florida, February.*
93. Ghose, A., P. Ipeiritis and A. Sundararajan. 2006. The Dimensions of Reputation in Electronic Markets. *Statistical Challenges in E-Commerce Research (SCECR), University of Minnesota, May.*
94. Forman, C., A. Ghose and A. Goldfarb. 2006. The Impact of Location on Consumer Purchases in Electronic Markets. *Statistical Challenges in E-Commerce Research (SCECR), University of Minnesota, May.*
95. Ghose, A. and B. Gu. 2006. Is Consumer Demand Kinked? Estimating Menu Costs and Search Costs in Electronic Markets. *Statistical Challenges in E-Commerce Research (SCECR), University of Minnesota, May.*
96. Ghose, A. and K. Huang. 2006. Personalized Pricing and Quality Design. *International Industrial Organization Conference, Boston, Massachusetts, April.*
97. Ghose, A. and K. Huang. 2005. Personalized Pricing and Quality Design. *Workshop on Information Systems and Economics (WISE 2005), UC Irvine, California, December.*
98. Ghose, A. and K. Huang. 2005. A Competitive Analysis of Personalized Pricing and Quality Customization. *Proceedings of the Workshop on CRM, New York University, November.*
99. Ghose, A. and A. Sundararajan. 2005. Pricing and Product Line Strategies for Software: Theory and Evidence. *INFORMS Annual Meeting, San Francisco, California, November.*
100. Ghose, A., M. Smith, and R. Telang. 2005. Internet Exchanges for Used Books: An Empirical Analysis of Product Cannibalization and Welfare Implications. *INFORMS Annual Meeting, San Francisco, California, November.*
101. Ghose, A. 2005. Used Good Trade and Adverse Selection: A Cross-Country Comparison of Electronic Secondary Markets. *INFORMS Annual Meeting, San Francisco, California, November.*

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102. Ghose, A. and A. Sundararajan. 2005. Pricing and Product Line Strategies for Software: Theory and Evidence. *Statistical Challenges in E-Commerce Research (SCECR)*, University of Maryland, College Park, May.
103. Ghose, A., M. Smith, and R. Telang. 2005. Product Cannibalization and Welfare Implications. *Statistical Challenges in E-Commerce Research (SCECR)*, University of Maryland, College Park, May.
104. Gal-Or, E., and A. Ghose. 2005. The Economic Consequences of Sharing Security Information. *International Industrial Organization Conference*, Atlanta, Georgia, April.
105. Ghose, A., M. Smith, and R. Telang. 2005. Internet Exchanges for Used Books: Welfare Implications and Policy Issues. *International Industrial Organization Conference*, Atlanta, Georgia, April.
106. Ghose, A., R. Telang and R. Krishnan. 2004. Impact of Electronic Secondary Markets on Information Goods Suppliers. *Workshop on Information Systems and Economics (WISE 2004)*, College Park, Maryland, December.
107. Ghose, A., M. Smith, and R. Telang. 2004. Internet Exchanges for Used Books: An Empirical Analysis of Welfare Implications and Policy Issues. *INFORMS Annual Meeting*, Denver, Colorado, October.
108. Ghose, A., M. Smith, and R. Telang. 2004. Internet Exchanges for Used Books: An Empirical Analysis of Welfare Implications and Policy Issues. *MISRC/CRITO Symposium on the Digital Divide*, Minneapolis, Minnesota, August.
109. Ghose, A., T. Mukhopadhyay, and U. Rajan. 2003. Strategic Benefits of Internet Referral Services. *International Conference on Electronic Commerce (ICEC 2003)*, Pittsburgh, October.
110. Ghose, A., R. Telang and R. Krishnan. 2003. Durable Goods Competition in Secondary Electronic Markets. *INFORMS Marketing Science Conference*, College Park, University of Maryland, June.
111. Ghose, A., T. Mukhopadhyay, and U. Rajan. 2002. Strategic Benefits of Internet Referral Services. *Workshop on Information Systems and Economics (WISE 2002)*, Barcelona, Spain, December.
112. Ghose, A., V. Choudhary, T. Mukhopadhyay, and U. Rajan. 2001. Dynamic Pricing on the Internet *Workshop on Information Systems and Economics (WISE 2001)*, New Orleans.

RESEARCH GRANTS AND AWARDS

- 2019 MSI Grant for “The Effect of Voice AI on Consumer Purchase and Search Behavior,” (with Chenshuo Sun, June Shi and Xiao Liu), \$8,000.
- 2019 MSI Grant for “Demand Effects of the Internet-of-Things Channel,” (with Vilma Todri and Panos Adamopolous), \$9,000.
- 2018 MSI Grant for “Using Artificial Intelligence to Automate Online-Offline Data Merger for Integrated Marketing,” (with Chenshuo Sun and Xiao Liu), \$6,500.
- 2016 NSF Grant for “Towards Building a Living Lab for mHealth Analytical and Behavioral Research using Internet of Things”, (with B. Li), \$230,000.
- 2015 Adobe Faculty Research Award for “Combining Machine Learning with Randomized Field Experiments to Improve Mobile Advertising,” (with B. Li) \$ 50,000.
- 2015 NET Institute Grant for “Towards Digital Attribution,” (with V. Todri), \$3,000.
- 2014 Wharton Customer Analytics Institute Award (with V. Todri, P. Adamapolous and P.V. Singh)
- 2014 Kauffman Grant for “Crowd funding Dynamics and its Impact on Entrepreneurial Landscape Empirical Analysis using Big Data,” (with G. Burtch and S. Wattal), \$30,000.

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- 2013 Google Faculty Research Award for “Mobile Analytics in the New Mobile Economy,” \$66,500.
- 2012 Marketing Science Institute Grant for “Apps and Advertising in the Mobile Economy,” \$15,000.
- 2012 SEI-Wharton Future of Advertising Grant for “Innovative Approaches to Measuring Advertising Effectiveness,” with (S. Han), \$6,000.
- 2012 Institute on Asian Consumer Insights (ACI) Grant for “Mobile Ad Effectiveness and App Adoption in Asian Markets,” \$30,000.
- 2012 Google Faculty Research Award for “Designing Ranking Systems for Product Search Engines,” (With P. Ipeirotis), \$60,000.
- 2012 NET Institute Grant for “Impact of Internet Intermediaries on Spread of STDs,” (with J. Chan), \$7,000.
- 2012 NYU Abu Dhabi Institute Seed Grant (with V. Dhar, N. Memon, H. Nissenbaum and R. Karri).
- 2010 NSF IGERT Research and Education Program (with R. Karri, N. Menon, H. Nissenbaum, and R. Zimmerman), \$2.9 million.
- 2010 MSI-Wharton Interactive Media Initiative (WIMI) Grant for “Modeling Consumer Behavior in Social Media: Analyzing the Role of Geographical Location and Multichannel Usage in Microblogging Platforms,” (with S. Han), \$10,000.
- 2010 Wharton Interactive Media Initiative (WIMI) Grant for “Modeling and Examining the Interdependence between Search and Display Advertising,” (with A. Goldfarb and S. Bae), \$5,000.
- 2010 Google-WPP Marketing Research Award for “Modeling The Dynamics Of Consumer Behavior In Mobile Advertising And Mobile Social Networks,” \$75,000.
- 2009 NSF Federal Cyberservice SFS Grant for “ASPIRE: An SFS Program for Interdisciplinary Research and Education” (co-PI with N. Menon, H. Nissenbaum, R. Karri, and R. Zimmerman), \$2.12 million.
- 2009 NYU Stern Center for Japan-US Business and Economics Studies Grant for “The Economic Value of User-Generated Multimedia Content: A Study of the Mobile Media Market in South Korea,” \$10,000.
- 2009 NET Institute Summer Grant for “A Structural Model of User Learning and Dynamics in Mobile Media Content,” (with S. Han).
- 2009 MSI-Wharton Interactive Media Initiative (WIMI) Grant for “The Economic Impact of User-Generated Content: Combining Text mining with Demand Estimation in the Hotel Industry,” (with P. Ipeirotis), \$ 6,500.
- 2009 MSI-Wharton Interactive Media Initiative Grant for “User Content Generation and Usage in Digital Media,” (with S. Han), \$ 6,500.
- 2009 NYU-Poly Research Grant for “The Economics of User-Generated Content in Online Social Media,” (with V. Dhar and K. Ross), \$73,500.
- 2008 NET Institute Summer Grant for “Impact of Product Attributes and Geography in Search Engine Advertising”
- 2007 Marketing Science Institute Grant for “An Empirical Analysis of Search Engine Advertising,” (with S. Yang), \$10,000.
- 2007 NET Institute Summer Grant for “An Empirical Analysis of Sponsored Search in Online Advertising,” (with S. Yang).
- 2007 NET Institute Summer Grant for “Using Text Analytics to Estimate the Economic Value of Online Product Reviews: An Empirical Analysis,” (with P. Ipeirotis).

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- 2007 Microsoft Virtual Earth Award for “Local Search for Hotels and Restaurants using Econometrics, Spatial Data, and Image Classification,” (with P. Ipeirotis), \$35,000.
- 2007 NSF CAREER Award, “Identifying and Measuring the Economic Value of Information on the Internet,” IIS-0643847, \$498,500.
- 2006 NYU Research Challenge Fund for “Consumer Use of Electronic Markets: An Empirical Analysis of New and Used Good Markets,” \$10,500.
- 2006 Microsoft Live Labs Award for “Combining Econometric and Text Mining Approaches for Measuring the Effect of Online Information Exchanges,” (with P. Ipeirotis) \$37,500.
- 2006 NET Institute Summer Grant for “Electronic commerce and Local Competition,” (with C. Forman and A. Goldfarb).
- 2006 NET Institute Summer Grant for “Search Costs and Menu Costs in Electronic Markets: Theory and Evidence,” (with B. Gu).
- 2005 NET Institute Summer Grant for “Used Good Trade and Adverse Selection: A Cross-Country Comparison of Electronic Secondary Markets,” \$10,500.
- 2005 NET Institute Summer Grant for “Pricing and Product Line Strategies for Consumer Software,” (with A. Sundararajan).
- 2003 Finalist, Third Annual e-BRC Doctoral Support Award Competition.

INVITED PRESENTATIONS, PLENARY TALKS, AND KEYNOTES

1. April 2023: Keynote Speech: Towards Building An AI-Based Organization: The Four Pillars Framework, Hi! Paris Conference, Paris, France.
2. January 2023. Empowering Patients Using STart Mobile Health Platforms: Evidence From A Randomized Field Experiment. Seminar, Tulane University.
3. October 2022. Mobile Health Platforms, Antitrust and Privacy. Annual Marketing Camp, University of Connecticut.
4. Seminar 2022. Mobile Health Platforms, Antitrust and Privacy. Seminar, University of Miami.
5. September 2022. Keynote Speech. Towards Building An AI-Based Organization: The Four Pillars Framework. World Knowledge Forum, Seoul, S. Korea.
6. August 2022. Keynote Speech. Towards Building An AI-Based Organization: The Four Pillars Framework. Data Driven Business, Sao Paulo, Brazil
7. June 2022: Keynote Speech, Monetizing Smartphone Data for Improving Business and Society, National University of Singapore
8. May 2022. Keynote Speech, Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment, Workshop on Human-AI Interaction, American University.
9. April 2022: Keynote Speech, Monetizing Smartphone Data for Improving Business and Society, AIS India Chapter.
10. April 2022: Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment. Seminar, Northwestern University, Kellogg.
11. April 2022: Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment. Seminar, Annual Marketing Camp, Rice University
12. February 2022. Monetizing Academic Research: Doing Research That Matters, IIT Kharagpur, India.
13. January 2022. Monetizing Smartphone Data for Improving Business and Society, IIM Calcutta, India.
14. December 2021. Keynote Speech. Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment. 13th Annual Behavioral Operations Management Conference, China.
15. August 2021. Keynote Speech. Monetizing Smart Phone Data for Improving Business and Society. National University of Singapore Global Research Forum on Computational Social Science.

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16. June 2021. Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment, Webinar, CVS-Aetna Keynote
17. April 2021. Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment, Webinar, IIM Udaipur.
18. February 2021. Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment, Webinar, Dartmouth College.
19. February 2021. Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment Digital Leadership Series, Webinar, Boston University.
20. January 2021. Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment Webinar, Webinar, University of Georgia.
21. November 2020. Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment Webinar, University of British Columbia.
22. November 2020. Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment Webinar, University of Washington.
23. October 2020. Empowering Patients Using Smart Mobile Health Platforms: Evidence From A Randomized Field Experiment Webinar, Harvard Business School.
24. July 2020. Mobile Targeting Using Customer Trajectory Patterns, Webinar, IIM Ahmedabad.
25. May 2020. Technology in the Post Covid World, TEDX Gateway Webinar, TED.
26. May 2020. Mobile Targeting Using Customer Trajectory Patterns, Webinar, Virtual Digital Economy Seminar.
27. May 2020. Trading Privacy for the Greater Social Good: How Did America React During COVID-19. Carlson School MIS Online Seminar.
28. May 2020. Using AI, Tech and Data Science to Combat Health Pandemics, NetElixir Expert Series Webinar.
29. May 2020. Using AI, Tech and Data Science to Combat Health Pandemics, YPO Philippines-Asia Webinar Event.
30. April 2020. Using AI, Tech and Data Science to Combat Health Pandemics, NYU Stern Covid 19 Webinar Series.
31. December 2019 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. AI Summit.
32. November 2019 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Bengal Chamber of Commerce.
33. September 2019 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Salesforce Executive Summit.
34. September 2019 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. NetElixir X=Experience Conference.
35. August 2019. Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. MBA Launch Summit. NYU Stern School.
36. July 2019 Keynote Speech. Digital Marketing Analytics. Big Data and Business Analytics Conference, Harbin, China.
37. June 2019 Keynote Speech. Winning in Omni-Channel Retail. Future of Retail Conference, Montreal.
38. May 2019 Plenary Speech. Legal Applications of Digital Marketing, Harvard Law School, Boston.
39. March 2019 Keynote Speech. Winning in Omni-Channel Retail. Aldar Group, Abu Dhabi, UAE.
40. March 2019 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Big Data and Business Analytics Conference, Lagos, Nigeria.
41. February 2019 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. CEO Summit Latin America, Miami.
42. February 2019 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Jack List, Osaka, Japan.
43. February 2019 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Deloitte Consulting Conference, Tokyo, Japan.

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44. January 2019 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Japanese Marketing Association, Tokyo, Japan.
45. October 2018 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. MMA Innovate, Mobile Marketing Association, NYC.
46. September 2018 Plenary Speech. Using AI and Blockchain to Monetize the Mobile Economy. MSI Immersion, Boston, September 2018.
47. August 2018 Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Melbourne Business Analytics Conference, Melbourne, Australia.
48. July 2018 Keynote Speech. Digital Marketing Analytics. Big Data and Business Analytics Conference, Harbin, China, July 2018.
49. June 2018. Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Harvard Club of New York.
50. May 2018. Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Peking University's Guanghua School of Management, New York.
51. May 2018. Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. ZEEMELT 2018, Mumbai.
52. May 2018. Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Yale University, Center for Customer Insights.
53. April 2018. Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Beijing, Plug and Play.
54. April 2018. Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Peking University, Beijing.
55. April 2018. Using AI and Blockchain to Monetize the Mobile Economy. ZAOJIU Talk, Shanghai.
56. April 2018. Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Institute of Internet Industry, Tsinghua University, Beijing.
57. April 2018. Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Shanghai National Accounting Institute, Shanghai.
58. March 2018. Keynote Speech. Using AI and Blockchain to Monetize the Mobile Economy. Donga Business Review Forum, Seoul, South Korea.
59. January 2018. Keynote Speech. Using Artificial Intelligence to Unlock the Mobile Economy. Indian School of Management & Entrepreneurship, Mumbai.
60. January 2018. Plenary Panelist. Ethics and Artificial Intelligence. National Retail Federation Conference, New York.
61. December 2017. Keynote Speech. Using Artificial Intelligence to Unlock the Mobile Economy. Digital Leadership Summit, Seoul.
62. December 2017. Invited Speaker. Measuring the Effectiveness of Mobile Marketing: Evidence from Multiple Field Experiments, Tel Aviv University, Israel.
63. December 2017. Keynote Speech. Using Artificial Intelligence to Unlock the Mobile Economy. Korea Internet Corporation Association, Seoul.
64. November 2017. Fireside Chat. Artificial Intelligence and Education. Leverage Edu, New Delhi.
65. November 2017. Plenary Speech. Artificial Intelligence and the Mobile Economy. Thinkers50 Conference, London.
66. October 2017. Keynote Speech. Using Artificial Intelligence to Unlock the Mobile Economy. Masters and Business Conference, Singularity University, Poland
67. October 2017. Keynote Speech. Using Artificial Intelligence to Unlock the Mobile Economy. Ignite Conference, University of Minnesota.
68. September 2017. Plenary Speech. Using Artificial Intelligence to Unlock the Mobile Economy. Behavioral Economics in Action Research, University of Toronto.
69. August 2017. Speech. Using Artificial Intelligence to Unlock the Mobile Economy, London.
70. July 2017. Keynote Speech. Big Data and Business Analytics Summer Conference, Harbin.

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71. July 2017. Plenary Speech. TAP: Unlocking the Mobile Economy. Yello Mobile Digital Marketing Group, Seoul.
72. July 2017. Plenary Speech. TAP: Unlocking the Mobile Economy. KP Financial Services Group, Seoul.
73. June 2017. Keynote Speech. TAP: Unlocking the Mobile Economy. Innovation Connect Economy Conference, Singapore.
74. June 2017. Keynote Speech. TAP: Unlocking the Mobile Economy. WPP-J.Walter Thompson Digital Conference, Shanghai.
75. May 2017. Plenary Speech. TAP: Unlocking the Mobile Economy. CKGSB Knowledge Series, NYC.
76. January 2017. Invited Speaker. Measuring the Effectiveness of Mobile Marketing: Evidence from Multiple Field Experiments, University of Miami.
77. December 2016. Invited Speaker. Measuring the Effectiveness of Mobile Marketing: Evidence from Multiple Field Experiments, Cornell University, Ithaca.
78. November 2016. Keynote Speech. Towards Revolutionizing New Frontiers in Mobile Marketing. CTAM Think, Annual Meeting, New York.
79. September 2016. Plenary Speech. Towards Revolutionizing New Frontiers in Mobile Marketing. Teradata PARTNERS Conference, Atlanta.
80. July 2016. Keynote Speech. Data Analytics in Digital Marketing, Harbin Institute of Technology, China.
81. June 2016. Plenary Speaker. Organization of Economic Cooperation and Development (OECD) Annual Meetings, Paris. Title: "Data and Algorithms".
82. April 2016. Keynote Speech. Revolutionizing Mobile Marketing Using Data Science, Philips Behavioral Analytics Summit, Eindhoven, The Netherlands.
83. April 2016. Keynote Speech. Revolutionizing Mobile Marketing Using Data Science, Latent View Conference, Chicago.
84. February 2016. Plenary Speech. New Frontiers in Mobile Marketing Analytics, Personalizationpalooza, New York.
85. February 2016. Plenary Speech. Towards Revolutionizing New Frontiers in Mobile Marketing Using Data Science, MSI Conference, New York.
86. February 2016. Plenary Speech. Using New Media in Islamic Banking, International Forum on Islamic Finance, Khartoum, Sudan.
87. February 2016. Keynote Speech. A Social Media and Digital Marketing Strategy for Banks, Bank of Khartoum, Sudan.
88. November 2015. Keynote Speech. Business Alliance: IT & Marketing Analytics, Milan.
89. October 2015. Keynote Speech, Towards Revolutionizing New Frontiers in Mobile Marketing Using Data Science, Digital Big Data, Smart Life & Mobile Marketing Analytics, New York.
90. October 2015. Plenary Panelist, Consumer Analytics Using Wearable and Mobile Technologies, Association of Consumer Research Roundtable, New Orleans.
91. October 2015. Keynote Speech. Using Randomized Field Experiments to Measure Mobile Marketing Effectiveness, Unleashing Data Summit: Innovations in Marketing, Research, Insights and Branding, New York.
92. September 2015. Invited Speaker. Measuring the Effectiveness of Mobile Marketing: Evidence from Multiple Field Experiments, Yale China India conference, New York.
93. September 2015. Invited Speaker. Measuring the Effectiveness of Mobile Marketing: Evidence from Multiple Field Experiments, Georgia State University, Atlanta.
94. September 2015. Plenary Speech. MIXX Canada, Interactive Advertising Bureau of Canada, Toronto.
95. August 2015 Keynote Speech. Crowdfunding in the Digital Economy, NYU Stern MBA Class of 2017, New York.
96. June 2015. Keynote Speech. Harvard Business Review, Latin America Conference, Sao Paulo, Brazil. Title: "Big Data and Analytics."
97. June 2015. Keynote Speech. Data Analytics in Digital Marketing, Harbin Institute of Technology, China.
98. June 2015. Plenary Speaker. Organization of Economic Cooperation and Development (OECD) Annual Meetings, Paris. Title: "The New Production Revolution".

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99. June 2015. Invited Speaker. ESSEC Business School. Title: "Randomized Field Experiments in Mobile Marketing."
100. June 2015. Invited Speaker. HEC. Title: "Randomized Field Experiments in Mobile Marketing."
101. May 2015. Invited Speaker. University of Minnesota. Title: "Randomized Field Experiments in Mobile Marketing."
102. May 2015. Invited Speaker. Adobe, San Jose. Title: "Combining Machine Learning With Randomized Field Experiments in Mobile Marketing."
103. May 2015. Invited Speaker. Stanford University. Title: "Randomized Field Experiments in Mobile Marketing."
104. May 2015. Invited Speaker. John Hopkins University. Title: "Randomized Field Experiments in Mobile Marketing."
105. April 2015. Invited Speaker. Rotman School (Marketing), University of Toronto. Title: "Randomized Field Experiments in Mobile Marketing."
106. April 2015. Invited Speaker. KAIST University, Seoul. Title: "Randomized Field and Natural Experiments in Mobile Marketing."
107. February 2015. Invited Speaker. University of British Columbia. Title: "Randomized Field and Natural Experiments in Mobile Marketing."
108. February 2015. Invited Speaker. Arizona State University. Title: "Randomized Field and Natural Experiments in Mobile Marketing."
109. February 2015. Plenary Speech. Big Data Summit, Toronto.
110. December 2014. Keynote Speech. NYCE Day. Title: "Randomized Field Experiments in Mobile Marketing".
111. November 2014. Invited Speaker, David Eccles School of Business (Marketing), University of Utah, Title: "Randomized Field Experiments in Mobile Marketing".
112. June 2014. Keynote Speech. Start-Up Grind, Shanghai. Title: "Big Data=Big Value".
113. June 2014. Keynote Speech. BTO Conference, Milan, Italy. Title: "Leveraging Mobile for Digital Innovation".
114. June 2014. Invited Speaker. Milan, Italy. Title: "Innovations in Mobile Marketing".
115. May 2014. Invited Speaker, Foster School of Business (Marketing), University of Washington, Seattle. Title: "Analyzing the Interdependence between Web and Mobile Advertising: A Randomized Field Experiment".
116. April 2014. Invited Speaker. KAIST University, Seoul. Title: "Randomized Field Experiments in Mobile Marketing."
117. March 2014: Keynote Speech. Workshop on Social & Business Analytics, University of Texas, Austin. Title: "Big Data, Randomized Field Experiments and Mobile Marketing Analytics".
118. December 2013. Keynote Speech. BTO Conference, Milan, Italy. Title: "Leveraging Mobile for Digital Innovation".
119. November 2013. Keynote Speech. Future of Business Event, NYU Stern. Title: "Using Big Data to Leverage The Mobile Consumer."
120. November 2013. Panel Moderator. Stern Graduate Marketing Association, NYU. Title: "Solving the Digital Equation."
121. October 2013. Plenary Speech. eBeverage Conference. Denver. Title: "Big Data and Mobile Analytics."
122. October 2013. Keynote Speech. Data Science and Big Data Initiative, Charlotte. Title: "Using Big Data to Leverage The Mobile Consumer." September 2013. Keynote Speech. NYU Stern Alumni, New York. Title: "Using Big Data to Leverage the Mobile Consumer."
123. September 2013. Plenary Speech. NYC Media Lab Research Summit, New York. Title: "Tapping into Crowd funding."
124. August 2013. Keynote Speech. Digital Summit, Hyderabad. "Mobile Economy and Location-Based Marketing."
125. August 2013. Keynote Speech. MBA Launch Summit. NYU Stern School. Title: "Technology, Innovation, and the Role of Business in Society."

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126. August 2013. Keynote Speech. Undergraduate Orientation. NYU Stern School. Title: "Technology, Innovation, and the Role of Business in Society."
127. June 2013. Keynote Speech. E-Metrics Conference, Chicago. Title: "Mobile Analytics: Apps, Advertising, and Commerce in the New Mobile Economy."
128. May 2013. Plenary Panelist. The Economist Innovation Forum Conference, San Francisco. Title: "Mind the Gap: Resolving the Skills Gap in Data Analytics".
129. May 2013. Invited Speaker. Innovative Approaches to Measuring Advertising Effectiveness Conference, Wharton School. Title: "Analyzing the Interdependence Between Web and Mobile Advertising."
130. April 2013. Invited Speaker. ESSEC Business School, (Marketing). Paris. Title: "Apps, Advertising, and Commerce in the New Mobile Economy."
131. April 2013. Invited Speaker. Heinz School, Carnegie Mellon, Pittsburgh. Title: "Apps, Advertising, and Commerce in the New Mobile Economy."
132. March 2013. Invited Speaker. Cheung Kong Graduate School of Business, (Marketing). Beijing. Title: "Ranking Products on Search Engines."
133. March 2013. Invited Speaker. Fudan University, (Marketing). Shanghai. Title: "Ranking Products on Search Engines."
134. March 2013. Invited Speaker. Tsinghua University School of Economics and Management, (Marketing). Beijing. Title: "Ranking Products on Search Engines."
135. March 2013. Invited Speaker. Paul Merage School of Business, University of California, Irvine. Title: "Ranking Products on Search Engines."
136. February 2013. Invited Speaker. Lerner School of Business, University of Delaware, Newark. Title: "Ranking Products on Search Engines."
137. February 2013. Webinar. International Institute of Business Analysis. Title: "Mobile Analytics: Apps, Advertising, and Commerce in the New Mobile Economy."
138. January 2013. Plenary Speech. Minnesota Big Data Analytics Conference. University of Minnesota, Minneapolis. Title: "Mobile Analytics: Apps, Advertising, and Commerce in the New Mobile Economy."
139. January 2013. Plenary Speech. Advertising and Data Science Congress. NYU Stern. Title: "Mobile Analytics: Apps, Advertising, and Commerce in the New Mobile Economy."
140. January 2013. Invited Speaker. Boston University, Boston. Title: "Ranking Products on Search Engines."
141. December 2012. Invited Speaker. Harvard Business School (Marketing), Boston. Title: "Apps, Advertising, and Commerce in the New Mobile Economy."
142. December 2012. Invited Speaker. Big Data Conference. MIT, Boston. Title: "Mobile Analytics: Apps, Advertising, and Commerce in the New Mobile Economy."
143. December 2012. Invited Speaker. David Eccles School of Business. University of Utah. Title: "Apps, Advertising, and Commerce in the New Mobile Economy."
144. November 2012. Keynote Speech. Big Data and Business Analytics. BTO Conference, Rome, Italy.
145. November 2012. Keynote Speech. Digital Marketing Summit, Indian School of Business. Title: "Mobile Analytics: Apps, Advertising, and Commerce in the New Mobile Economy."
146. October 2012. Plenary Speech. Orange Institute. Title: "Mobile Analytics."
147. October 2012. Invited Speaker. TED lecture series. TEDxNYU. Title: "Mobile Marketing Trends."
148. September 2012. Moderator. NYU Stern Center for Measurable Marketing. Panel on "Measurable Marketing in the Path to Purchase."
149. August 2012. Keynote Speech. Launch 2012. NYU Stern School. Title: "Technology, Innovation, and the Role of Business in Society."
150. May 2012. Plenary Speech. IBC Workshop, Institute of E-Commerce & Digital Markets (LMU) in Munich, Germany. Title: "Social Media and Digital Marketing Trends."
151. May 2012. Invited Speaker. London Business School (Marketing). Title: "London Interplay Between Search and Social Media: Designing Ranking Systems for Search Engines."
152. April 2012. Invited Speaker. Korea University, Seoul. Title: "Apps, Advertising, and Commerce in the New Mobile Economy."

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153. April 2012. Invited Speaker. University of Texas at Austin, Austin. Title: "Interplay Between Search and Social Media: Designing Ranking Systems for Search Engines."
154. March 2012. Invited Speaker. Wharton School, Philadelphia. Title: "Interplay Between Search and Social Media: Designing Ranking Systems for Search Engines."
155. March 2012. Keynote Speech. Allianz Group-CIO Conference, Milan, Italy. Title: "Outlook 2013: Social Media and Digital Marketing Trends."
156. March 2012. Plenary Speech. BTO Conference, Milan, Italy. Title: "Social Media and Digital Marketing Trends."
157. March 2012. Invited Speaker. University of Connecticut, Storrs. Title: "Interplay Between Search and Social Media: Designing Ranking Systems for Search Engines."
158. February 2012. Moderator. Carlson School, University of Minnesota. Panel on "Leveraging Social Media for Business."
159. February 2012, Moderator. Stern in Africa Conference, NYU Stern. Panel on "Emerging Industries in Africa."
160. November 2011. Invited Speaker. UCLA (Economics), Los Angeles. Title "Interplay Between Search and Social Media: Designing Ranking Systems for Search Engines."
161. November 2011. Invited Speaker. Michigan State, East Lansing. Title: "Interplay Between Search and Social Media: Designing Ranking Systems for Search Engines."
162. October 2011. Invited Speaker. Harvard Business School, Boston. Title: "Interplay Between Search and Social Media: Designing Ranking Systems for Search Engines."
163. September 2011. Invited Speaker. University of Arizona, Tucson. Title: "Interplay Between Search and Social Media: Designing Ranking Systems for Search Engines."
164. August 2011. Keynote Speech. Launch 2011. NYU Stern School. Title: "Technology, Innovation, and the Role of Business in Society."
165. June 2011. Plenary Panelist. Statistical Challenges in Ecommerce Research (SCECR) conference, Rio De Janeiro, Brazil. Title: "Smart-Everything: Cyber Analytics Platforms and Real-Time Monitoring of the Real World."
166. May 2011. Plenary Panelist. NYU Stern Conference on Measurable Marketing in a Digital World. Title: "Cross Media Effectiveness Measurement."
167. September 2009. Invited Speaker. Internet Economics Conference, Stanford University. Title: "User Content Generation and Usage Behavior in Multi-Media Settings: A Dynamic Structural Model of Learning."
168. April 2009. Invited Speaker. Columbia University. Title: "Combining Text mining with Econometrics: Monetization of User-Generated Content and Online Advertising."
169. April 2009. Invited Speaker. Microsoft Research, Boston. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
170. April 2009. Invited Speaker. Heinz College, Carnegie Mellon University. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
171. March 2009. Invited Speaker. Wharton School, University of Pennsylvania. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
172. March 2009. Keynote Speech. Ecommerce and Banking 3.0 Conference, Frankfurt, Germany. Title: User Generated Content and Monetization in the New Economy."
173. March 2009. Invited Speaker. University of Goethe-Frankfurt. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
174. March 2009. Invited Speaker. University of Connecticut. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
175. February 2009. Invited Speaker. University of Calgary. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
176. February 2009. Invited Speaker. Purdue University. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."

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177. February 2009. Invited Speaker. University of California at Irvine. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
178. November 2008. Invited Speaker. University of Texas at Dallas. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
179. November 2008. Invited Speaker. Polytechnic University of NYU. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
180. November 2008. Invited Speaker. Speaker on the Square Series, NYU. Title: "User Generated Content, Panel on Technology in the Digital Age."
181. October 2008. Invited Speaker. McGill University. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
182. May 2008. Invited Speaker. University of Washington, Seattle. Title "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
183. March 2008. Invited Speaker. IBM Research. Mining User-Generated Content Using Econometrics: A Case Study on Reputation Systems.
184. February 2008. Invited Speaker. Yahoo Research. Mining User-Generated Content Using Econometrics: A Case Study on Reputation Systems.
185. February 2008. Invited Speaker. Marketing Science Institute. Title: "An Empirical Analysis of Search Engine Advertising: Sponsored Search in Electronic Markets."
186. November 2007. Invited Speaker. University of Minnesota, Minneapolis. Title: "The Dimensions of Reputation in Electronic Markets."
187. June 2007. Invited Speaker. City University of Hong Kong. Title: "The Dimensions of Reputation in Electronic Markets."
188. June 2007. Invited Speaker. Hong Kong University of Science and Technology. Title: "The Dimensions of Reputation in Electronic Markets."
189. June 2007. Invited Speaker. Nanyang Business School, Singapore. Title: "The Dimensions of Reputation in Electronic Markets."
190. June 2007. Invited Speaker. Singapore Management University. Title: "The Dimensions of Reputation in Electronic Markets."
191. June 2007. Invited Speaker. National University of Singapore. Title: "The Dimensions of Reputation in Electronic Markets."
192. June 2007. Invited Speaker. Conference on Operational Excellence in Retailing. Harvard University (HBS). Title: "Internet Exchanges for Used Books: An Empirical Analysis of Product Cannibalization and Welfare Implications."
193. June 2007. Invited Speaker. Triennial Invitational Choice Symposium, Wharton School. Personalized Pricing and Quality Design.
194. February 2007. Invited Speaker. University of Texas at Austin. Title: "Geography and Ecommerce: Measuring Convenience, Selection and Price."
195. January 2007. Invited Speaker. University of Florida. Title: "Geography and Ecommerce: Measuring Convenience, Selection and Price."
196. November 2006. Invited Speaker. Moore School of Business, University of South Carolina. Geography and Ecommerce: Measuring Convenience, Selection, and Price.
197. November 2006. Invited Speaker. Marketing Lunchtime Seminar, NYU Stern School of Business. Title: "Geography and Ecommerce: Measuring Convenience, Selection, and Price."
198. June 2006. Invited Speaker. Conference on Operational Excellence in Retailing. Wharton School. Title: "The Impact of Location on Consumer Purchases in Electronic Markets."
199. April 2006. Invited Speaker. Drexel University. Title: "Personalized Pricing and Quality Design."
200. January 2006. Invited Speaker. Ohio State University. Title: "Internet Exchanges for Used Books: An Empirical Analysis of Product Cannibalization and Welfare Implications."
201. February 2004. Invited Speaker. University of Southern California. Title: "Impact of Internet Referral Services on the Supply Chain."

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202. February 2004. Invited Speaker. University of Arizona. Title: "Impact of Internet Referral Services on the Supply Chain."
203. February 2004. Invited Speaker. University of Maryland at College Park. Title: "Impact of Internet Referral Services on the Supply Chain."

CONFERENCE PRESENTATIONS

1. August 2019. Invited Speaker. Title: AI and Blockchain in Marketing. Emory University Conference, Atlanta.
2. June 2019. Invited Speaker. Title: AI and Blockchain in Omni Channel Marketing. INFORMS Marketing Science Conference, Rome.
3. June 2019. Invited Speaker. Title: AI and Blockchain in Marketing. AMA Seth Annual Marketing Conference, New York.
4. June 2018. Invited Speaker. Title: Using AI and Blockchain in Marketing. INFORMS Marketing Science Conference.
5. October 2014. Invited Speaker, INFORMS Annual Conference, Thought Leader Series. Title: "Randomized Field Experiments in Mobile Marketing."
6. May 2014. Conference Presentation. Crowds 2.0 Conference, NYU Stern School. Title: "Privacy Controls and Anonymity in Crowd funding."
7. November 2013. Conference Presentation. Mapping Mobile Conference, NYU Stern School. Title: "Randomized Field Experiments to Measure ROI of Mobile Advertising and Mobile Coupons".
8. June 2013. Conference Presentation. Marketing Science Conference, Istanbul. Title: "Estimating Cross Platform and Cross Device Synergies Between Web and Mobile Advertising."
9. June 2011. Conference Presentation. Statistical Challenges in ecommerce Research (SCECR) conference, Rio De Janeiro, Brazil. Title: "How is the Mobile Internet Different?"
10. June 2011. Conference Presentation. ZEW Conference, Mannheim. Title: "Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content."
11. June 2010. Conference Presentation. Marketing Science Conference, Cologne. Title: "Estimating Demand in the Hotel Industry by Mining User-Generated and Crowd-Sourced Content."
12. June 2010. Conference Presentation. Searle Research Symposium on the Economics and Law of Internet Search, Northwestern University. Title: "Estimating Demand in the Hotel Industry by Mining User- Generated and Crowd-Sourced Content."
13. May 2010. Customer Insights Conference, Yale University. Conference Presentation. Title: "Estimating Demand in the Hotel Industry by Mining User-Generated and Crowd-Sourced Content."
14. December 2009. Conference Presentation. Workshop on Information Technology and Systems (WITS), Phoenix. Title: "Towards Designing Ranking Systems for Hotels on Travel Search Engines: Combining Text mining with Demand Estimation in the Hotel Industry."
15. December 2009. Conference Presentation. MSI-WIMI Conference, University of Pennsylvania, Philadelphia. Title: "User Content Generation and Usage Behavior in Multi-Media Settings: A Dynamic Structural Model of Learning."
16. August 2009. Conference Presentation. Marketing Dynamics Conference, NYU Stern, August. Title: "User Content Generation and Usage Behavior in Multi-Media Settings: A Dynamic Structural Model of Learning."
17. June 2009. Conference Presentation. Marketing Science Conference, University of Michigan, Ann Arbor. Title: "User Content Generation and Usage Behavior in Multi-Media Settings: A Dynamic Structural Model of Learning."
18. January 2009. Conference Presentation. The Economics of the Internet and Software, Toulouse. Title: "Modeling and Estimating the Relationship Between Organic and Paid Search Advertising."
19. December 2008. Conference Presentation. International Symposium on Information Systems (ISIS),

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- ISB, Hyderabad. Title: "Modeling and Estimating the Relationship Between Organic and Paid Search Advertising."
20. December 2008. Conference Presentation. International Conference on Information Systems (ICIS), Paris. Market Frictions, Demand Structure and Price Competition in Online Markets.
 21. December 2008. Conference Presentation. Workshop on Information Systems and Economics (WISE), Paris. Title: "Modeling and Estimating the Relationship Between Organic and Paid Search Advertising."
 22. December 2008. Conference Presentation. Workshop on Information Technology and Systems (WITS), Paris. An Empirical Analysis of Search Engine Advertising: Sponsored and Organic Search in Electronic Markets.
 23. November 2008. Conference Presentation. Federal Trade Commission, Washington DC. Title: "Modeling and Estimating the Relationship Between Organic and Paid Search Advertising."
 24. October 2008. Conference Presentation. INFORMS Annual Meeting, Washington DC. Title: "The Dimensions of Reputation in Electronic Markets."
 25. October 2008. Conference Presentation. INFORMS CIST, Washington DC. Title: "Deriving the Pricing Power of Product Features by Mining User-Generated Reviews."
 26. August 2008. Conference Presentation. International Workshop on Data mining and Audience Intelligence for Advertising. ADKDD. Las Vegas. Title: "Comparing Performance Metrics in Organic Search with Sponsored Search Advertising."
 27. June 2008. Conference Presentation. Marketing Science Conference, Vancouver. Title: "An Empirical Analysis of Search Engine Advertising: Sponsored Search in Electronic Markets."
 28. May 2008. Conference Presentation. International Industrial Organization Conference, Washington DC. Title: "An Empirical Analysis of Search Engine Advertising: Sponsored Search in Electronic Markets."
 29. April 2008. Conference Presentation. NET Institute Conference, NYU. Title: "An Empirical Analysis of Search Engine Advertising: Sponsored Search in Electronic Markets."
 30. February 2008. Conference Presentation. ACM WSDM Conference, Stanford University. Title: "An Empirical Analysis of Search Engine Advertising: Sponsored Search in Electronic Markets."
 31. December 2007. Conference Presentation. International Conference on Information Systems (ICIS) Montreal. Title: "Estimating Menu Costs in Electronic Markets."
 32. December 2007. Conference Presentation. Workshop on Information Systems and Economics (WISE), Montreal. Title: "Towards Empirically Modeling Consumer and Firm Behavior in Sponsored Search Advertising."
 33. November 2007. Conference Presentation. Conference on Information Systems and Technology (CIST), Seattle. Title: "An Empirical Analysis of Search Engine Advertising: Sponsored Search in Electronic Markets."
 34. November 2007. Conference Presentation. INFORMS, Seattle. Title: "Examining the Relationship Between Reviews and Sales: The Role of Reviewer Identify Disclosure in Electronic Markets."
 35. August 2007. Conference Presentation. International Conference on Electronic Commerce (ICEC), Minnesota. Title: "Designing Novel Review Ranking Systems: Predicting Usefulness and Impact."
 36. August 2007. Conference Presentation. International Conference on Electronic Commerce (ICEC), Minnesota. Title: "An Empirical Analyses of Paid Placement in Online Keyword Advertising."
 37. May 2007. Conference Presentation. Statistical Challenges in E-Commerce. Title: "Designing Novel Review Ranking Systems on the Web: Combining Economics with Opinion Mining."
 38. April 2007. Conference Presentation. NET Institute Conference, New York University. Title: "Geography and Ecommerce: Measuring Convenience, Selection and Price."
 39. January 2007. Conference Presentation. DIMACS Workshop, Rutgers University. Title: "Designing Trusted Ranking Systems for Consumer Reviews: Combining Economics with Opinion

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- Mining.”
40. January 2007. Conference Presentation. International Conference on Decision Support Systems (ICDSS), IIM Kolkata, India. Title: “Designing Ranking Systems for Consumer Reviews: The Economic Impact of Customer Sentiment in Electronic Markets.”
 41. December 2006. Conference Presentation. International Symposium on Information Systems (ISIS), ISB, Hyderabad. Title: “Estimating Menu Costs in Electronic Markets.”
 42. December 2006. Conference Presentation. International Symposium on Information Systems (ISIS), ISB, Hyderabad. Title: “The Dimensions of Reputation in Electronic Markets.”
 43. December 2006. Conference Presentation. International Symposium on Information Systems (ISIS), ISB, Hyderabad. Title: “The Impact of Location on Consumer Use of Electronic Markets.”
 44. December 2006. Conference Presentation. Workshop on Information Technology and Systems (WITS), Milwaukee. Title: “Towards an Understanding of the Impact of Customer Sentiment on Product Sales and Review Quality.”
 45. December 2006. Conference Presentation. International Conference on Information Systems (ICIS), Milwaukee. Title: “The Impact of Location on Consumer Purchases in Electronic Markets.”
 46. December 2006. Conference Presentation. Workshop on Information Systems and Economics (WISE), Northwestern University, Evanston. Title: “Search Costs, Demand Structure and Long Tail in Electronic Markets: Theory and Evidence.”
 47. November 2006. Conference Presentation. INFORMS Annual Meeting, Pittsburgh. Title: “Impact of Internet Referral Services on the Supply Chain.”
 48. November 2006. Conference Presentation. INFORMS Annual Meeting, Pittsburgh. Title: “Estimating Menu Costs in Electronic Markets.”
 49. November 2006. Conference Presentation. INFORMS Annual Meeting, Pittsburgh. Title: “The Impact of Location on Consumer Purchases in Electronic Markets.”
 50. November 2006. Conference Presentation. INFORMS Conference on Information Systems and Technology (CIST), Pittsburgh. Title: “Software Versioning and Quality Degradation? An Exploratory Study of the Evidence.”
 51. October 2006. Conference Presentation. ZEW Conference on ICT, Mannheim. Title: “Information Uncertainty in Electronic Markets: An Empirical Analysis of Trade Patterns and Adverse Selection.”
 52. June 2006. Conference Presentation. Workshop on Economics and Information Security (WEIS), Cambridge University. Title: “The Economic Impact of Regulatory Information Disclosure on Information Security Investments, Competition, and Social Welfare.”
 53. June 2006. Conference Presentation. INFORMS Marketing Science Conference, Pittsburgh. Title: “Personalized Pricing and Quality Design.”
 54. May 2006. Conference Presentation. Statistical Challenges in E-Commerce Research, University of Minnesota. Title: “The Dimensions of Reputation in Electronic Markets.”
 55. April 2006. Conference Presentation. International Industrial Organization Conference, Boston. Title: “Personalized Pricing and Quality Design.”
 56. April 2006. Conference Presentation. NET Institute Conference, New York University. Title: “Used Good Trade and Adverse Selection in Electronic Secondary Markets.”
 57. March 2006. Conference Presentation. Impact of Internet Referral Services on the Supply Chain. ISR Workshop, University of Michigan at Ann Arbor.
 58. February 2006. Conference Presentation. University of Florida. Title: “The Dimensions of Reputation in Electronic Markets.”
 59. December 2005. Conference Presentation. International Conference on Information Systems (ICIS), Las Vegas. Title: “Software Versioning and Quality Degradation? An Exploratory Study of the Evidence.”
 60. December 2005. Conference Presentation. Workshop on Information Systems and Economics (WISE), UC Irvine, California. Title: “Personalized Pricing and Quality Design.”
 61. November 2005. Conference Presentation. Workshop on CRM, New York University. Title:

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- “A Competitive Analysis of Personalized Pricing and Quality Customization.”
62. November 2005. Conference Presentation. INFORMS Annual Meeting, San Francisco, California. Title: “Pricing and Product Line Strategies for Software: Theory and Evidence.”
 63. November 2005. Conference Presentation. INFORMS Annual Meeting, San Francisco, California. Title: “Used Good Trade and Adverse Selection: A Cross-Country Comparison of Electronic Secondary Markets.”
 64. June 2005. Conference Presentation. Workshop on Economics of Information Security, Harvard University, Boston. Title: “Pricing Security Software.”
 65. May 2005. Conference Presentation. Statistical Challenges in ecommerce Research. Maryland. Title: “Pricing and Product Line Strategies for Consumer Software: Evidence from Amazon.”
 66. April 2005. Conference Presentation. International Industrial Organization Conference. Atlanta. Title: “The Economic Incentives for Sharing Security Information.”
 67. January 2005. Conference Presentation. Hawaiian International Conference on System Sciences. Hawaii. Title: “Effect of Electronic Secondary Markets on the Supply Chain.”
 68. December 2004. Conference Presentation. Workshop on Information Systems and Economics (WISE). University of Maryland at College Park. Title: “Impact of Secondary Electronic Markets on Information Goods Suppliers.”
 69. December 2003. Conference Presentation. International Conference on Information Systems (ICIS). Seattle, WA. Title: “Durable Goods Competition in the Presence of Secondary E-Marketplaces.”
 70. December 2003. Conference Presentation. International Conference on Information Systems (ICIS). Seattle, WA. Title: “Internet Exchanges for Used Books: An Empirical Investigation into Welfare Implications and Policy Issues.”
 71. October 2003. Conference Presentation. International Conference on E-Commerce (ICEC). Pittsburgh, PA. Title: “Strategic Benefits of Internet Referral Services.”
 72. October 2003. Conference Presentation. Conference on Information Systems and Technology (CIST), Atlanta, GA. Title: “Dynamic Pricing: A Strategic Advantage for Electronic Retailers.”
 73. June 2003. Conference Presentation. Workshop on Economics of Information Security. University of Maryland at College Park. Title: “The Economic Incentives for Sharing Security Information.”
 74. December 2002. Conference Presentation. Workshop on Information Systems and Economics (WISE). Barcelona, Spain. Title: “Impact of Internet Referral Services on the Supply Chain.”
 75. December 2002. Conference Presentation. International Conference on Information Systems (ICIS). Barcelona, Spain. Title: “Dynamic Pricing: A Strategic Advantage for Internet Retailers”.
 76. November 2002. Conference Presentation. INFORMS Conference on Information Systems and Technology (CIST), San Jose. Title: “Impact of Referral Services on Channel Profits: Competition between Manufacturers and Info mediaries.”
 77. February 2004. Invited Speaker. University of California at Irvine. Title: “Impact of Internet Referral Services on the Supply Chain.”
 78. February 2004. Invited Speaker. Tulane University. Title: “Impact of Internet Referral Services on The Supply Chain.”
 79. February 2004. Invited Speaker. University of Connecticut. Title: “Impact of Internet Referral Services on the Supply Chain.”
 80. February 2004. Invited Speaker. New York University. Title: “Impact of Internet Referral Services on the Supply Chain.”
 81. January 2004. Invited Speaker. University of Alberta. Title: “Impact of Internet Referral Services on The Supply Chain.”
 82. May 2011. Plenary Panelist. India World Conference, New York. Title “India's IT Industry: The End of the Beginning”.
 83. May 2011. Invited Speaker. Rising Star Speaker Series, Case Western University. Cleveland. Title: “Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content.

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84. May 2011. Invited Speaker. MIT (Sloan Marketing), Boston. Title: "Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content."
85. April 2011. Invited Speaker. Columbia University (GSB Marketing), New York. Title: "Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content."
86. April 2011. Invited Speaker. Seoul National University, Seoul. Title: "Designing Ranking Systems For Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content."
87. January 2011. Invited Speaker. MSI Young Scholar's Conference, Utah. Title: "Search and Social Media in the Digital Economy: A Research Agenda."
88. December 2010. Plenary Panelist. Workshop on Information Systems and Economics, Phoenix, Arizona. Title: "Whither WISE."
89. October 2010. Invited Speaker. University of Maryland, College Park. Title: "Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content".
90. October 2010. Invited Speaker. Distinguished Speaker Series, Georgia Tech, Atlanta, October. Title: Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd- Sourced Content.
91. September 2010. Plenary Panelist. Workshop on Interdisciplinary Studies in Information Security and Privacy, Abu Dhabi. Title: "Privacy Issues in Social Media and Ecommerce."
92. September 2010. Invited Speaker. Harvard University (Economics), Boston. Title: "Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content."
93. September 2010. Invited Speaker. George Mason University, Washington DC. Title: "Designing Ranking Systems for Hotels on Travel Search Engines By Mining User-Generated and Crowd-Sourced Content."
94. July 2010. Invited Speaker. NBER IT Economics & Productivity Workshop, Boston. Title: "Estimating Demand in the Hotel Industry by Mining User-Generated and Crowd-Sourced Content."
95. July 2010. Invited Speaker. Stanford Institute of Theoretical Economics (SITE), Stanford University. Title: "A Dynamic Structural Model of User Learning in Mobile Media Content."
96. June 2010. Invited Speaker. Workshop on Digital Business Models, Paris. Title: "Estimating Demand in the Hotel Industry by Mining User-Generated and Crowd-Sourced Content."
97. June 2010, Plenary Speech. L2 Mobile Commerce Clinic at NYU Stern. Title: "Mobile Trends, Consumers, and Social Media."
98. April 2010. Invited Speaker. Temple University. Title: "Estimating Demand in the Hotel Industry by Mining User-Generated and Crowd-Sourced Content."
99. February 2010. Invited Tutorial. Carlson School. University of Minnesota. Title: "Structural Econometric Modeling: Static and Dynamic Models".
100. February 2010. Invited Speaker. University of Minnesota. Title: "Estimating Demand in the Hotel Industry by Mining User-Generated and Crowd-Sourced Content."
101. September 2009. Invited Speaker. Internet Economics Conference, Stanford University. Title: "User Content Generation and Usage Behavior in Multi-Media Settings: A Dynamic Structural Model of Learning."
102. April 2009. Invited Speaker. Columbia University. Title: "Combining Text mining with Econometrics: Monetization of User-Generated Content and Online Advertising."
103. April 2009. Invited Speaker. Microsoft Research, Boston. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
104. November 2008. Invited Speaker. Speaker on the Square Series, NYU. Title: "User Generated Content, Panel on Technology in the Digital Age."
105. October 2008. Invited Speaker. McGill University. Title: "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."

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106. May 2008. Invited Speaker. University of Washington, Seattle. Title "Search Engine Advertising: Sponsored Search, Organic Search, and User-Generated Content in Electronic Markets."
107. March 2008. Invited Speaker. IBM Research. Mining User-Generated Content Using Econometrics: A Case Study on Reputation Systems.
108. February 2008. Invited Speaker. Yahoo Research. Mining User-Generated Content Using Econometrics: A Case Study on Reputation Systems.
109. February 2008. Invited Speaker. Marketing Science Institute. Title: "An Empirical Analysis of Search Engine Advertising: Sponsored Search in Electronic Markets."
110. November 2007. Invited Speaker. University of Minnesota, Minneapolis. Title: "The Dimensions Of Reputation in Electronic Markets."
111. June 2007. Invited Speaker. City University of Hong Kong. Title: "The Dimensions of Reputation In Electronic Markets."
112. June 2007. Invited Speaker. Hong Kong University of Science and Technology. Title: "The Dimensions of Reputation in Electronic Markets."
113. June 2007. Invited Speaker. Nanyang Business School, Singapore. Title: "The Dimensions of Reputation in Electronic Markets."
114. June 2007. Invited Speaker. Singapore Management University. Title: "The Dimensions of Reputation in Electronic Markets."
115. June 2007. Invited Speaker. National University of Singapore. Title: "The Dimensions of Reputation in Electronic Markets."
116. June 2007. Invited Speaker. Conference on Operational Excellence in Retailing. Harvard University (HBS). Title: "Internet Exchanges for Used Books: An Empirical Analysis of Product Cannibalization and Welfare Implications."
117. June 2007. Invited Speaker. Triennial Invitational Choice Symposium, Wharton School. Personalized Pricing and Quality Design.
118. February 2007. Invited Speaker. University of Texas at Austin. Title: "Geography and Ecommerce: Measuring Convenience, Selection and Price."
119. January 2007. Invited Speaker. University of Florida. Title: "Geography and Ecommerce: Measuring Convenience, Selection and Price."
120. November 2006. Invited Speaker. Moore School of Business, University of South Carolina. Geography and Ecommerce: Measuring Convenience, Selection, and Price.
121. November 2006. Invited Speaker. Marketing Lunchtime Seminar, NYU Stern School of Business. Title: "Geography and Ecommerce: Measuring Convenience, Selection, and Price."
122. June 2006. Invited Speaker. Conference on Operational Excellence in Retailing. Wharton School. Title: "The Impact of Location on Consumer Purchases in Electronic Markets."
123. April 2006. Invited Speaker. Drexel University. Title: "Personalized Pricing and Quality Design."
124. January 2006. Invited Speaker. Ohio State University. Title: "Internet Exchanges for Used Books: An Empirical Analysis of Product Cannibalization and Welfare Implications."
125. February 2004. Invited Speaker. University of Southern California. Title: "Impact of Internet Referral Services on the Supply Chain."
126. February 2004. Invited Speaker. University of Arizona. Title: "Impact of Internet Referral Services on the Supply Chain."
127. February 2004. Invited Speaker. University of Maryland at College Park. Title: "Impact of Internet Referral Services on the Supply Chain."
128. February 2004. Invited Speaker. University of California at Irvine. Title: "Impact of Internet Referral Services on the Supply Chain."
129. February 2004. Invited Speaker. Tulane University. Title: "Impact of Internet Referral Services on the Supply Chain."
130. February 2004. Invited Speaker. University of Connecticut. Title: "Impact of Internet Referral Services on the Supply Chain."

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131. February 2004. Invited Speaker. New York University. Title: “Impact of Internet Referral Services on the Supply Chain.”
132. January 2004. Invited Speaker. University of Alberta. Title: “Impact of Internet Referral Services on the Supply Chain.”

TEACHING

- EMBA: Digital Marketing Analytics, NYU Spring 2023. (Instructor Rating: 4.9/5)
- MBA: Digital Marketing Analytics, NYU Winter 2023. (Instructor Rating: 4.9/5)
- MBA: Digital Marketing Analytics, NYU Summer 2022. (Instructor Rating: 4.9/5)
- MSBA: Digital Marketing Analytics, NYU Summer 2022. (Instructor Rating: 4.74/5)
- EMBA: Digital Marketing Analytics, NYU Spring 2022. (Instructor Rating: 4.4/5)
- MBA: Digital Marketing Analytics, NYU Winter 2022. (Instructor Rating: 4.7/5)
- MSBA: Digital Marketing Analytics, NYU Summer 2021. (Instructor Rating: 4.75/5)
- EMBA: Digital Marketing Analytics, NYU Spring 2021. (Instructor Rating: 4.9/5)
- MBA: Digital Marketing Analytics, NYU Winter 2021. (Instructor Rating: 4.5/5)
- MSBA: Digital Marketing Analytics, NYU Summer 2020. (Instructor Rating: 4.7/5)
- MBA: Digital Marketing Analytics, NYU Summer 2020. (Instructor Rating: 4.5/5)
- EMBA: Digital Marketing Analytics, NYU Spring 2020. (Instructor Rating: 4.6/5)
- MBA: Digital Marketing Analytics, NYU Fall 2019. (Instructor Rating: 4.8/5)
- MBA: Digital Marketing Analytics, NYU Summer 2019. (Instructor Rating: 4.8/5)
- MSBA: Digital Marketing Analytics, NYU Summer 2019. (Instructor Rating: 4.8/5)
- EMBA: Digital Marketing Analytics, NYU Spring 2019. (Instructor Rating: 4.8/5)
- MSBA: Digital Marketing Analytics, NYU Summer 2018. (Instructor Rating: 4.7/5)
- MBA: Digital Marketing Analytics, NYU Summer 2018. (Instructor Rating: 4.6/5)
- EMBA: Digital Marketing Analytics, NYU Spring 2018. (Instructor Rating: 4.8/5)
- MBA: Digital Marketing Analytics, NYU Fall 2017. (Instructor Rating: 6.8/7)
- MBA: Digital Marketing Analytics, NYU Summer 2017. (Instructor Rating: 6.7/7)
- MSBA: Digital Marketing Analytics, NYU Summer 2017. (Instructor Rating: 6.6/7)
- EMBA: Digital Marketing Analytics, NYU Spring 2017. (Instructor Rating: 6.8/7)
- UG: Social Media and Digital Marketing Analytics, NYU Fall 2016. (Instructor Rating: 6.7/7)
- MBA: Digital Marketing Analytics, NYU Fall 2016. (Instructor Rating: 6.8/7)
- Exec Ed: Leveraging Social Media and Digital Marketing, Spring 2016. (Instructor Rating: 6.5/7)
- MBA: Digital Marketing Analytics, NYU Summer 2016. (Instructor Rating: 6.6/7)
- MSBA: Digital Marketing Analytics, NYU Summer 2016. (Instructor Rating: 6.4/7)
- EMBA: Digital Marketing Analytics, NYU Spring 2016. (Instructor Rating: 6.6/7)
- UG: Social Media and Digital Marketing Analytics, NYU Fall 2015. (Instructor Rating: 6.7/7)
- MBA: Digital Marketing Analytics, NYU Summer 2015. (Instructor Rating: 6.6/7)
- Exec Ed: Leveraging Social Media and Digital Marketing, Spring 2015. (Instructor Rating: 6.5/7)
- TRIUM MBA: Social Media & Digital Marketing Analytics, NYU Fall 2015. (Instructor Rating: 4.5/5)
- MSBA: Digital Marketing Analytics, NYU Summer 2015. (Instructor Rating: 6.6/7)
- EMBA: Social Media and Digital Marketing Analytics, NYU Spring 2015. (Instructor Rating: 6.4/7)
- UG: Social Media and Digital Marketing Analytics, NYU Fall 2014. (Instructor Rating: 6.8/7)
- TRIUM MBA: Social Media & Digital Marketing Analytics, NYU Fall 2014. (Instructor Rating: 4.5/5)

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- MSBA: Digital Marketing Analytics, NYU Summer 2014. (Instructor Rating: 6.9/7)
- MBA: Digital Marketing Analytics, NYU Summer 2014. (Instructor Rating: 6.3/7)
- Exec Ed: Leveraging Social Media and Digital Marketing, Spring 2014. (Instructor Rating: 6.9/7)
- Exec Ed: Leveraging Social Media and Digital Marketing, Fall 2013. (Instructor Rating: 6.7/7)
- EMBA: Social Media and Digital Marketing Analytics, NYU Spring 2014. (Instructor Rating: 6.85/7)
- UG: Social Media and Digital Marketing Analytics, NYU Fall 2013. (Instructor Rating: 6.7/7)
- MSBA: Social Media and Digital Marketing Analytics, NYU Fall 2013. (Instructor Rating: 6.8/7)
- TRIUM MBA: Social Media & Digital Marketing Analytics, NYU Fall 2013. (Instructor Rating: 3.9/5)
- MBA: Social Media and Digital Marketing Analytics, NYU Summer 2013. (Instructor Rating: 6.5/7)
- Exec Ed: Leveraging Social Media and Digital Marketing, Spring 2013. (Instructor Rating: 6.0/7)
- MBA: Social Media and Digital Marketing Analytics, NYU Fall 2012. (Instructor Rating: 6.0/7)
- UG: Social Media and Digital Marketing Analytics, NYU Fall 2012. (Instructor Rating: 6.2/7)
- UG: IT in Business & Society: UG Core, NYU Fall 2010. (Instructor Ratings: 6.5/7, 6.6/7)
- UG: Electronic Commerce and Social Media: NYU Fall 2009. (Instructor Rating: 6.0/7)
- UG: IT in Business & Society: UG Core, NYU Fall 2008. (Instructor Ratings: 6.6/7, 6.7/7)
- UG: Electronic Commerce: UG Elective, NYU Fall 2008. (Instructor Rating: 6.6/7)
- UG: IT in Business & Society: UG Core, NYU Fall 2007. (Instructor Ratings: 6.6/7, 6.7/7)
- UG: Electronic Commerce: UG Elective, NYU Fall 2007. (Instructor Rating: 6.8/7)
- UG: IT in Business & Society: UG Core, NYU Fall 2006. (Instructor Ratings: 6.8/7, 7/7)
- UG: Electronic Commerce: UG Elective, NYU Fall 2006. (Instructor Rating: 6.7/7)
- UG: IT in Business & Society: UG Core, NYU Fall 2005. (Instructor Ratings: 6.6/7, 6.8/7, 6.6/7)
- UG: IT in Business & Society: UG Core, NYU, Fall 2004. (Instructor Ratings: 6.2/7, 6.3/7)
- UG: MIS, CMU, Summer 2003. (Instructor Rating: 5/5).

PROFESSIONAL SERVICE (JOURNALS)

- **Department Editor** – *Management Science* (July 2020 –)
- **Senior Editor** – *Information Systems Research* (September 2012 – December 2020)
- **Associate Editor** – *Management Science* (Jan 2009 – June 2020)
- **Associate Editor** – *Management Science* Special Issue on Business Analytics (August 2012)
- **Associate Editor (Ad Hoc)** – *Management Science* (2008 – 2009)
- **Associate Editor** – *Information Systems Research* (Jan 2009 –December 2012)
- **Associate Editor (Ad Hoc)** – *MIS Quarterly* (2010 – Present)
- **Associate Editor** – *MIS Quarterly*, Special Issue on “Perspectives on Trust in Information Systems,” 2009.
- **Editorial Board** – *Information Systems Research*, Special Issue on “Digital Systems & Competition”, 2008.
- **Reviewer** – *American Economic Review*, *Decision Support Systems*, *Economic Theory*, *Electronic Commerce Research and Applications*, *IEEE Transactions on Knowledge and Data Engineering*, *International Journal of Electronic Commerce*, *Information Systems Research*, *International Journal of Industrial Organization*, *Journal of Economics and Management Strategy*, *Journal of Industrial*

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Economics, Journal of Management Information Systems, Management Science (Information Systems), Management Science (Marketing), Marketing Science, Journal of Marketing Research, MIS Quarterly, Operations Research Letters, Production and Operations Management.

- **Panel Member** – Hong Kong Research Grants Council. (2014 – 2020)

PROFESSIONAL SERVICE (CONFERENCES & WORKSHOPS)

- **WISE Co-Chair** – Workshop on Information Systems and Economics (WISE), 2017, Seoul, December.
- **Track co-Chair** – E-Business and Mobile, International Conference on Information Systems (ICIS) 2016, Dublin.
- **Conference Co-Chair** – Workshop on Information Systems and Economics (WISE), 2014, Auckland, December.
- **Track co-Chair** – Economics of Information Systems, International Conference on Information Systems (ICIS) 2012, Orlando.
- **Senior Program Committee** – ACM Electronic Commerce Conference 2012, Spain, June.
- **Senior Program Committee** – ACM Electronic Commerce Conference 2011, San Jose, June.
- **Program Committee** – INFORMS Conference on Information Systems and Technology (CIST) 2012, October.
- **Program Committee** – INFORMS Conference on Information Systems and Technology (CIST) 2010, Austin, November.
- **Program Committee** - The First International Workshop on Opinion Mining for Business Intelligence (OMBI 2010), Toronto, August.
- **Program Committee** - Workshop on Social Media Analytics (SOMA 2010), Washington DC, July
- **Program Committee** – ACM Electronic Commerce Conference 2010, Boston, June
- **Conference Co-Chair** – INFORMS Conference on Information Systems and Technology (CIST), 2009, San Diego, October.
- **Conference Co-Chair** – Workshop on Information Systems and Economics (WISE), 2008, Paris, December.
- **Conference Co-Organizer** – First New York Computer Science and Economics Day (NYCE Day), 2008, September.
- **Steering Committee Member** - Second New York Computer Science and Economics Day (NYCE Day), 2009, November.
- **Conference Co-Chair** – Fourth Symposium on Statistical Challenges in Ecommerce Research (SCECR) 2008, NY, May.
- **Track Chair** – Pacific Asia Conference on Information Systems (PACIS) 2009, India, July (Ecommerce Track).
- **Track Chair** – Pacific Asia Conference on Information Systems (PACIS) 2008, China, July (Economics of Information Systems Track).
- **Associate Editor** – International Conference on Information Systems (ICIS) 2009, Phoenix, December (Economics of Information Systems Track).
- **Associate Editor** – International Conference on Information Systems (ICIS) 2008, Paris, December

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(Economics of Information Systems Track).

- **Associate Editor**–International Conference on Information Systems (ICIS) 2007, Montreal, December (*Web-Based Information Systems Track*).
- **Associate Editor**–International Conference on Information Systems (ICIS) 2007, Montreal, December (*Economics and Business Value of Information Systems Track*).
- **Program Committee** – ACM Electronic Commerce Conference 2009, Stanford, June.
- **Program Committee** – World Wide Web Conference 2009 (WWW), Spain, May.
- **Program Committee** – World Wide Web Conference 2008 (WWW), Beijing, May (*Social Networks and Web 2.0 Track and Internet Monetization Track*)
- **Program Committee** – International Conference on Web Search and Data Mining (WSDM) 2008, Stanford University, February.
- **Program Committee**–Workshop on Interdisciplinary Studies in Security and Privacy, 2008 (WISSP), NYU-Polytechnic, September.
- **Program Committee**–International Conference on Electronic Commerce 2007 (ICEC), Minnesota, August.
- **Program Committee**–Workshop on Economics of Information Security 2007 (WEIS), Pittsburgh, June.
- **Program Committee** – INFORMS Conference on Information Systems and Technology (CIST) 2007, Seattle, November.
- **Program Committee** – ACM Electronic Commerce Conference 2007, San Diego, June.
- **Program Committee**–International Conference on Decision Support Systems 2007, Kolkata, January
- **Program Committee**–International Symposium of Information Systems 2006, Hyderabad, December
- **Associate Editor**–International Conference on Information Systems 2006 (ICIS), Milwaukee, December (*Economics of Information Systems Track*).
- **Associate Editor**–International Conference on Information Systems 2006 (ICIS), Milwaukee, December (*General Track*).
- **Program Committee**–INFORMS Conference on Information Systems and Technology 2006 (CIST), Pittsburgh, November 2006.
- **Program Committee**–INFORMS Conference on Information Systems and Technology 2005 (CIST), San Francisco, November 2005.
- **Session Chair** – CIST 2008, WEIS 2007, June, Pittsburgh, ICDSS 2007, Kolkata, January, INFORMS 2006, (*ISR Sponsored Cluster*), Pittsburgh, November, INFORMS (*IS Economics Cluster*) 2005, San Francisco, November, INFORMS CIST 2005, San Francisco, November.
- **Discussant** – Workshop in Information Systems and Economics 2011 (Shanghai), Workshop in Information Systems and Economics 2010 (St. Louis), Workshop in Information Systems and Economics 2009 (Phoenix), International Industrial Organization Conference 2008 (Washington DC), International Conference on Information Systems 2007(Montreal), ZEW Workshop on ICT 2006 (Germany), Workshop in Information Systems and Economics 2006 (Evanston), Statistical Challenges in Electronic Commerce 2006 (Minneapolis), International Industrial Organization Conference 2006 (Boston), International Industrial Organization Conference 2005 (Atlanta), Workshop in Information Systems and Economics 2005 (Irvine).

APPENDIX A**UNIVERSITY SERVICE**

- NYU Senate 2020 – Present
- NYU Senate Financial Affairs Committee 2020 – Present
- Academic Director, Masters in Business Analytics 2017 – Present
- Capstone Co-Director, Masters in Business Analytics 2016 – Present
- Director, Center for Business Analytics 2015 – 2018
- Co-Director, Center for Business Analytics 2012 – 2015
- IOMS Core Curriculum Review Committee 2017 – 2018
- MBA Core Curriculum Review Committee 2016
- MSBA Curriculum Review Committee, 2015 – 2016
- External Review Committee, OPIM Department, Wharton School, 2015
- IOMS Executive Committee, 2013 – 2018
- Stern Dean's Faculty Advisory Committee, 2012 – Present
- Stern MBA Launch Committee, 2011– 2014
- NYU Stern-Poly Collaboration Taskforce Committee, 2011
- Stern Doctoral Program Review Committee, 2010
- Stern Research Resources Committee, New York University, 2010 –
- Track Director for Interactive Marketing, CeDER, NYU Stern, 2009–2010.
- Panel Judge in India Leadership Exchange Program Competition, 2009.
- AACSB Review Junior Faculty Team, Stern School, 2009.
- IS faculty member, Stern Undergraduate Honors Program, 2006 – 2012.
- Ph.D. Committee, IOMS Department, Stern School, 2005 – 2006, 2009–Present.
- Coordinator, Information Systems Research Seminar series, Stern School, 2005 – 2007.
- Stern School Team India Committee under Dean Kim Corfman, 2008 –2009.
- Panelist on “Life and Lifestyle for Untenured Faculty Members,” New Faculty Orientation at Stern School, New York University 2006, 2007, 2008.
- Promotion & Tenure Review Committee, IOMS Department, Stern School, 2006.
- Strategic Planning Meeting, Stern School, 2006.
- Faculty Recruitment Committee, IOMS Department, Stern School, 2005 – 2006.
- Panelist on “Effective Teaching Strategies”, New Faculty Orientation at NYU Stern, 2005.
- Doctoral Student Committee, Carnegie Mellon University, 2002–2004.

POST-DOCTORAL STUDENT SUPERVISION

1. Dr. Hilah Levin (Post Doctoral Advisor, NYU, 2019–2020)
2. Dr. Sang-Pil Han (Post Doctoral Advisor, NYU, 2008–2011 (Now Assistant Professor at Arizona State University))
3. Dr. Sung-Hyuk Park (Post Doctoral Advisor, NYU, 2012– 2014) (Now Assistant Professor, KAIST)
4. Dr. Dominik Molitor (Post Doctoral Advisor), NYU, 2015 – 2016 (Now Assistant Professor at Fordham University)

APPENDIX A**DOCTORAL STUDENT SUPERVISION**

1. Prasanna Parasurama – 5th year Student, Stern School, TOPS Department
2. Peiyan Yu – 4th year, Stern School, TOPS Department
3. Rubing Li – 3rd year, Stern School, TOPS Department
4. Eunsol Cho – 3rd year, Stern School, TOPS Department
5. Hongxian Xu – 1st year, Stern School, Marketing Department
6. Chenshuo Sun – Stern School (Thesis Chair), (now Assistant Professor at National University of Singapore)
7. Andrew Lee – KAIST (Thesis Committee), (now Assistant Professor at University of Texas at Dallas)
8. Carlos Fernandez – Stern School, (Thesis Committee), (now Assistant Professor at Hong Kong University of Science and Technology)
9. Shunyuan Zhang – Tepper School, Carnegie Mellon University (Thesis Committee), (Assistant Professor at Harvard Business School)
10. Vilma Todri – Stern School, (Chair), (Assistant Professor at Emory University)
11. Panos Adamopolous - Stern School (Thesis Committee), (Assistant Professor at Emory University)
12. Xuan Ye – Stern School (Thesis Committee), (Assistant Professor at Boston College)
13. Yuqian Xu – Stern School (Thesis Committee), (Assistant Professor at University of Illinois at Urbana Champaign)
14. Jason Chan – Stern School (Chair), (Assistant Professor at Carlson School, University of Minnesota)
15. Beibei Li – Stern School, (co-Chair), (Assistant Professor at Carnegie Mellon University)
16. Gordon Burtch – Fox School of Business, Temple University (co-Chair), (Assistant Professor at Carlson School, University of Minnesota)
17. Yan Huang – Heinz College, Carnegie Mellon University (Thesis Committee), (Assistant Professor at Ross School, University of Michigan)
18. Ke-Wei Huang – Stern School, IOMS Department (Thesis Committee), (Assistant Professor at National University of Singapore)
19. Zheyin (Jane) Gu – Stern School, Marketing Department (Thesis Committee), (Assistant Professor at SUNY Albany)
20. Rong Zheng – Stern School, IOMS Department (Thesis Committee), (Assistant Professor at Hong Kong University of Science and Technology)
21. Manuel Arriaga – Stern School, IOMS Department (Thesis Committee), (Assistant Professor at Cambridge University)
22. Nikolay Archak – Stern School, IOMS Department (Thesis Committee), (Six Sigma)
23. Sanghee Bae – Stern School, Marketing Department (Thesis Committee)
24. Mingdi Xin – Stern School, IOMS Department (Proposal Committee), Graduated 2009 (now Assistant Professor at University of California at Irvine)
25. Akhmed Umyarov – Stern School, IOMS Department (Proposal Committee), Graduated 2010 (now Assistant Professor at University of Minnesota)
26. Zubin Jelveh – 6th year Student, NYU Poly
27. Wally Wang – 2nd year Student, Stern School, IOMS Department.

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UNDERGRADUATE STUDENT SUPERVISION

1. Sanjana Gupta – Stern School (Undergraduate Honors Thesis Advisor)
2. Prita Kumar – Stern School (Undergraduate Honors Thesis Advisor)
3. Rohan Deshpande – Stern School (Undergraduate Project Advisor)
4. Pratik Mehta – Stern School (Undergraduate Honors Thesis Advisor)
5. Aileen Chua – Stern School (Undergraduate Honors Thesis Advisor)
6. Elliott Finch – Stern School (Undergraduate Honors Thesis Advisor)

PROFESSIONAL MEMBERSHIPS

- **Research Council Member:** Wharton Customer Analytics Institute (2011 – 2017).
- **Scientific Advisory Board,** Hi! PARIS, France (2020-Present)
- **Faculty Affiliate:** Marketing Science Institute (2008 – Present)
- **Member:** Association of Information Systems (AIS), Information Systems Society (ISS), INFORMS, Marketing Science Society, American Economic Association (AEA).

SELECTED CONSULTING

Alibaba, Apple, Bank of Khartoum, Berkeley Corporation, CBS, CTBC Taiwan, Dataxu, DFS Group, Facebook, Google, HCL-Hewlett Packard, HR Ratings Mexico, IBM, IBus, Lucidity, Marico India, Microsoft, NetCore, NBC Universal, OneVest, Revenue Roll, Samsung, Snapchat, TD Bank, Tinder, Verizon, Yahoo, ZeroWeb, 1-800-Contacts.

INDUSTRY POSITIONS

2022 – Present	Advisor, Revenue Roll
2020 – Present	Senior Consultant (Affiliated Expert), Compass Lexecon
2020 – Present	Governing Board of ICISA, Comptroller and Auditor General of India (CAG)
2020 – 2021	Advisor, Trippal
2019 – 2022	Advisor, NetCore
2018 – Present	Advisor, Tamoco
2018 – Present	Advisory Board, All India Gaming Federation
2018 – 2021	Advisor, Lucidity
2018 – 2019	Advisor, Adrealm
2018 – 2022	Advisor, ZeroWeb
2017 – Present	Advisor, Leverage Edu
2017 – Present	Advisor, Ibus Networks
2017 – Present	Advisor, EywaMedia
2017 – 2020	Affiliated Scientific Expert, Analysis Group
2017 – 2020	Affiliated Scientific Expert, Keystone Strategy
2014 – 2020	Affiliated Scientific Expert, Cornerstone Research
2014 – 2018	Advisor, OneVest
2013 – 2017	Chief Data Scientist, 3TI Shanghai, China
1999 – 2000	Senior Consultant, IBM.
1998 – 1999	Business Development Manager, HCL-Hewlett Packard.
1997	Management Trainee, Glaxo SmithKline Beecham.

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SELECTED PRESS COVERAGE & OPINION PIECES

1. *The Washington Post*, April 2023
2. *ANA*, February 2023
3. *Yahoo Finance*, January 2023
4. *Yahoo Finance*, June 2022
5. *Vox*, June 2022
6. *NBC News*, February 2022
7. *Los Angeles Times*, February 2022
8. *NPR/Marketplace*, January 2022
9. *Forbes*, November 2021
10. *Consumer Reports*, November 2021
11. *Quartz*, August 2021
12. *CNN*, July 2021
13. *Quartz*, June 2021
14. *Quartz*, April 2021
15. *Campaign Asia*, March 2021
16. *Quartz*, March 2021
17. *Hindusthan Times* March 2021
18. *Adweek*, December 2020
19. *Marketplace*, November 2020
20. *Adweek*, November 2020
21. *Business Insider*, October 2020
22. *Business Insider*, October 2020
23. *Quartz*, September 2020
24. *Business Because*, September 2020
25. *Quartz*, September 2020
26. *BBC*, July 2020
27. *Money Control*, June 2020
28. *Wall Street Journal*, May 2020
29. *Yahoo Finance*, April 2020
30. *LiveMint*, April 2020
31. *The Economic Times*, April 2020
32. *Forbes*, April 2020
33. *LiveMint*, April 2020
34. *NDTV*, March 2020
35. *Ad Exchanger*, Feb 2020
36. *Campaign Asia*, Feb 2020
37. *Forbes*, Jan 2020
38. *Knowledge@Wharton*, December 2019
39. *Quartz*, December 2019
40. *Channel Futures*, December 2019
41. *Quartz*, December 2019
42. *Quartz*, November 2019
43. *The Economic Times*, July 2019
44. *CNN*, June 2019
45. *CNBC*, May 2019
46. *Marketplace*, April 2019
47. *Quartz*, April 2019
48. *Science Daily*, March 2019
49. *CNN*, March 2019

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50. *Quartz*, February 2019
51. *CNBC*, January 2019
52. *The Quartz*, January 2018
53. *Forbes*, December 2018
54. *Science Daily*, November 2018
55. *Market Watch*, November 2018
56. *CNN*, September 2018
57. *CNBC*, September 2018
58. *Fox 4KC*, September 2018
59. *The Quartz*, September 2018
60. *Consumer Affairs*, September 2018
61. *NPR Marketplace*, September 2018
62. *The Quartz*, August 2018
63. *CNBC TV*, June 2018
64. *NASDAQ TV*, June 2018
65. *CNBCTV*, June 2018
66. *The Wall Street Journal*, June 2018
67. *AdAge India*, May 2018
68. *Harvard Business Review*, May 2018
69. *AdWeek*, May 2018
70. *The Economic Times*, April 2018
71. *The Quartz*, April 2018
72. *The Economic Times*, April 2018
73. *INC*, March 2018
74. *The Quartz*, March 2018
75. *The Quartz*, February 2018
76. *The Washington Post*, January 2018
77. *Voice of America*, January 2018
78. *Associated Press*, January 2018
79. *The Economic Times*, January 2018
80. *The Quartz*, January 2018
81. *The Entrepreneur*, December 2017
82. *US News*, December 2017
83. *The Quartz*, December 2017
84. *DBR Korea*, December 2017
85. *Hankyung Korea*, December 2017
86. *MarketWatch*, November 2017
87. *mHealthIntelligence*, November 2017
88. *The Quartz*, October 2017
89. *Engadget*, September 2017
90. *NBC News*, August 2017
91. *Business Insider*, August 2017
92. *The Globe and Mail*, July 2017
93. *Bloomberg View*, June 2017
94. *The Economic Times*, June 2017
95. *MarketWatch*, June 2017
96. *The Economic Times*, May 2017
97. *The Quartz*, May 2017
98. *CNBC*, April 2017
99. *ReCode*, April 2017
100. *The Economic Times*, April 2017

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101. *Ad Exchanger*, April 2017
102. *The Quartz*, March 2017
103. *NPR Marketplace*, January 2017
104. *The Quartz*, January 2017
105. *Knowledge at Wharton*, January 2017
106. *Market Watch*, December 2016
107. *The Quartz*, December 2016
108. *The Street*, December 2016
109. *NBC News*, November 2016
110. *Knowledge at Wharton*, November 2016
111. *WIRED*, November 2016
112. *San Francisco Chronicle*, October 2016
113. *CKGSB Knowledge*, October 2016
114. *ABC News*, October 2016
115. *WIRED*, October 2016
116. *The New York Post*, September 2016
117. *NPR Marketplace*, September 2016
118. *NPR Marketplace*, July 2016
119. *The Quartz*, July 2016
120. *The Quartz*, May 2016
121. *The Quartz*, April 2016
122. *CNBC*, March 2016
123. *OZY*, March 2016
124. *The Daily Mail*, February 2016
125. *OZY*, February 2016
126. *Business Because*, December 2015
127. *Investors' Business Daily*, November 2016.
128. *OZY*, November 2015
129. *NDTV*, September 2015
130. *The Entrepreneur*, August 2015
131. *The Conversation*, August 2015
132. *Business Because*, July 2015
133. *The New York Times*, June 2015
134. *Business Because*, May 2015
135. *The Economist*, May 2015
136. *BBC World News*, March 2015
137. *The Financial Times*, March 2015
138. *USA Today*, February 2015
139. *Washington Post*, February 2015
140. *The Economist*, January 2015
141. *National Public Radio*, January 2015
142. *Newsweek*, January 2015
143. *The Guardian* January 2015
144. *The Toronto Sun*, January 2015
145. *Bloomberg Media*, January 2015
146. *The Economic Times* January 2015
147. *The Business Standard*, January 2015
148. *The Economic Times* December 2014
149. *USA Today*, December 2014
150. *OZ*, December 2014
151. *Bloomberg Media*, October 2014

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152. *LA Times*, October 2014
153. *Business Week*, September 2014
154. *The Wall Street Journal*, September 2014
155. *MBAPrograms*, June 2014
156. *The Programmatic Mind*, June 2014
157. *USA Today*, May 2014
158. *Ecommerce Times*, March 2014
159. *Bloomberg TV*, March 2014
160. *Time*, March 2014
161. *National Review Online*, March 2014
162. *Business2Community*, March 2014
163. *Business Week Poets and Quants*, February 2014
164. *Mobile Marketer*, November 2013
165. *Ecommerce Times*, November 2013
166. *National Public Radio*, October 2013
167. *Ecommerce Times*, October 2013
168. *Xinhua*, October 2013
169. *Time*, September 2013
170. *PC World*, September 2013
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APPENDIX A

Expert Depositions and Testimony

1. Deposition of Anindya Ghose, in *In re Facebook, Inc.*, IPO Securities and Derivative Litigation, on behalf of *Facebook, Inc. and the Defendants*, United States District Court, Southern District of New York, Case No. 1:12-md-02389 (April 30, 2015).
2. Deposition of Anindya Ghose, in re Appraisal of *AOL Inc.*, on behalf of *Petitioners*, Court of Chancery of the State of Delaware, Consolidated C.A. No. 11204-VCG (February 14, 2017).
3. Deposition of Anindya Ghose, in *In re Facebook, Inc.*, IPO Securities and Derivative Litigation, *on behalf of Facebook, Inc. and the Defendants*, United States District Court, Southern District of New York, Case No. 1:12-md-02389 (February 22, 2017).
4. Trial Testimony of Anindya Ghose, in re Appraisal of *AOL Inc.*, on behalf of *Petitioners*, Court of Chancery of the State of Delaware, Consolidated C.A. No. 11204-VCG (March 7, 2017).
5. Deposition of Anindya Ghose, in *Federal Trade Commission vs. 1-800 Contacts* litigation, on behalf of *1-800-Contacts and the defendants*, Docket No. 9372 (March 14, 2017).
6. Trial Testimony of Anindya Ghose, in the matter of determination of rates and terms for making and distributing phonorecords (phonorecords III) Docket No. 16-CRB-0003-PR (2018-2022) on behalf of *Apple, Inc.* (March 23, 2017).
7. Trial Testimony of Anindya Ghose, in the matter of determination of rates and terms for making and distributing phonorecords (phonorecords III) Docket No. 16-CRB-0003-PR (2018-2022) on behalf of *Apple, Inc.* (April 12, 2017).
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9. Deposition of Anindya Ghose, in *Snapchat, Inc. vs. Vaporstream* litigation, on behalf of Snapchat and the Defendants, Case No. 2:17-cv-220 (June 6, 2018).
10. Deposition of Anindya Ghose, in *Fuse Chicken LLC vs. Amazon.com* litigation, on behalf of *Fuse Chicken*, Case No. 5:17-cv-01538 (January 14, 2019).
11. Deposition of Anindya Ghose, in *Natalia Karasik, et al. v. Yahoo! Inc., Yahoo! Canada Co., Oath, Altaba and Verizon*, on behalf of *Yahoo*, Court File No. CV-16-566248-00CP. (August 27, 2019).
12. Deposition of Anindya Ghose, in *Social Tech vs. Apple Inc.* litigation, on behalf of *Apple*, Case No. 3:18-cv-05945-VC (September 18, 2019).
13. Deposition of Anindya Ghose, in *In re Snapchat, Inc.*, IPO Securities and Derivative Litigation, on behalf of *Snap, Inc. and the Defendants*, United States District Court, Central District of California, Case No. 2:17-cv-03679-SVWAGR (December 16, 2019).

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14. Trial Testimony of Anindya Ghose, in *Marcus Wide of Grant Thornton (British Virgin Islands) Ltd. and Hugh Dickson of Grant Thornton Spst. Services (Cayman) Ltd., as joint liquidators of Stanford International Bank vs. Toronto-Dominion Bank* litigation, on behalf of *TD Bank*, (March 9-10, 2021).
15. Deposition of Anindya Ghose, in *Sean Rad et al. vs. IAC/Interactivecorp, Match Group, Inc., and Match Group, LLC* Litigation, on behalf of *Tinder Plaintiffs*, Case No. 654038/2018 (June 7, 2021).
16. Deposition of Anindya Ghose, in *District of Columbia vs. Facebook, Inc.*, Litigation, on behalf of *Facebook Inc.*, Case No. 2018 CA 008715 B (March 22, 2022).
17. Deposition of Anindya Ghose, in *Securities & Exchange Commission (SEC) vs. Eric Dalius et al.*, on behalf of *SEC*, Case No. 2:18-cv-08497-CJC-E (April 18, 2022).
18. Deposition of Anindya Ghose, in *Csupo et al. vs. Alphabet (Google)* on behalf of *Alphabet (Google)*, Case No. 19CV352557 (March 21, 2023).

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Appendix B

Materials Considered

Court Documents

Defendant Google LLC’s Fourth Supplemental Responses and Objections to Plaintiffs’ Interrogatories, Set One, *Anibal Rodriguez and Julie Anna Muniz v. Google LLC, et al.*, United States District Court, Northern District of California, San Francisco, July 14, 2020.

Defendant Google LLC’s Second Supplemental Objections and Responses to Plaintiffs’ Interrogatories, Set Six, *Anibal Rodriguez and Julie Anna Muniz v. Google LLC, et al.*, United States District Court, Northern District of California, San Francisco, July 14, 2020.

Deposition of Anibal Rodriguez, October 16, 2022.

Deposition of Julian Santiago, March 7, 2022.

Deposition of Sal Cataldo, February 17, 2022.

Deposition of Steve Ganem, October 28, 2022.

Deposition of Susan Harvey, October 27, 2022.

Expert Report of Michael J. Lasinski, February 20, 2023 (including reliance materials).

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